Addis Ababa Science and Technology University
College of Architecture and Civil Engineering

Effect of Procurement Methods on Construction Project Performance in Ethiopia

A Project Work submitted and Presented to College of Architecture and Civil Engineering of Addis Ababa Science and Technology University in partial fulfillment of the requirements for the Degree of Masters of Engineering in Construction Technology and Management.

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APPROVAL PAGE

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DEDICATION

This Paper is dedicated to my children “Yosi and Sara” and wishes them this inspires to pursue their education and lead a fruitful life**.**

Acknowledgment

First and for most thank and bless pass to almighty God who give me the patience and endurance to finish this work.

I would like to forward my gratitude thanks to Dr.-Ing Girmay Kahassay and Engineer Tamirat Mulu who support in reviewing, commenting and guiding on the study of this project paper. Their advice and valuable comment specially during preparing the project proposal advanced my knowledge to a degree where I could perform the study.

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List of Abbreviations

BOQ	Bill of Quantity
BOT	Build-Operate-Transfer
BPF	British Property Federation
CIOB	The Chartered Institute of Building
CM	Construction Management
CM/GC	Construction Manager/General Contractor
CMWU	Coastal Municipalities Water Utility
CPARs	Country Procurement Assessment Report
DB	Design-Build
DBB	Design-Bid-Build
ICB	International Competitive Bidding
MAUA	Multi-Atribute Utility Approach
NCB	National Competitive Bidding
NGOs	Non-Government Organizations
NS	National Shopping
PPA	Public Procurement Agency
PPP	Public Private Partnership
PPPP	Public Private Partnership Procurement Method
RFP	Request for Proposal
RFQ	Request for Qualification
RII	Relative Importance Index
SPSS	Statistical Package for the Social Sciences
UAE	United Arab Emirates
UK	United Kingdom
WB	World Bank

Abstract

Construction project performance is highly influenced by the type of construction procurement method used to deliver the project. In this research paper the different procurement methods applicable in Ethiopia was investigated and the effect of procurement methods on construction project performance was assessed. To achieve the objective of the research an interview and structured questionnaire were prepared and distributed to selected engineering procurement specialist and construction consulting offices in Ethiopia. Accordingly, from the respondent feed back through questionnaire analysis was made utilizing SPSS 20 and simple frequency method. The results and discussion concentrate on two directions which the first one is to identify and rank of the effect of the selected procurement methods on construction projects performance, and the second one is to set alternative procurement methods for construction projects in Ethiopia. It is found that the procurement methods in use are much of traditional methods specifically the lowest qualified bidder which has direct contribution to projects cost and time overrun which lead to poor performance of projects towards attaining the intended target. Establishment of legislation and laws that encourage using of alternatives procurement methods such as Design and Build and Public Private Partnership Procurement method were suggested.

Keywords: Construction project, procurement method, performance, cost, time

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CHAPTER ONE

INTRODUCTION

1.1 Background of the study

The construction Industry is one of the major development constraints in developing countries. This is mainly because developing countries are considerably dependent on the growth and development of their physical infrastructures. Besides, it's linkage to both their economic and social sectors are very significant. Without the development of these physical infrastructures, developing countries will remain deficient in:

- Distributing resources within and across countries,
- Providing accesses to economic, political and social services,
- Attracting local and foreign investments, etc.

As a result, they consume unprecedented budgetary (financial) resources towards developing these infrastructures. Unlike the developed world, most of these infrastructures remained the burden of the public sector because the private sector in developing countries is weak. (Wubshet, 2004,)

The procurement of construction project is vast in scope because it involves the gathering and organizing of myriads of separate individuals, firms and companies to design manage and build construction products such as houses, office buildings, shopping complex, roads, bridges etc. for specific clients or "customers". Procurement comes from the word procure which literally means "to obtain by care or effort"; "to bring about" and "to acquire". System is about "organized method, approach, technique, process or procedure". In this context, project procurement is very much concerned with the organized methods or process and procedure of obtaining or acquiring a construction product such as a house, shopping complex or road and jetty. It also involves arranging and coordinating people to achieve prescribed goals or objectives.

The Aqua Group (1999) described procurement as the process of obtaining or acquiring goods and services from another for some consideration. Masterman (1996) described project procurement as the organizational structure needed to design and build construction projects for a specific client.

It is in a sense very true because the process of "obtaining" a building by a client involves a group of people who are brought together and organized systematically in terms of their roles, duties, responsibilities and interrelationship between them.

Today, there are several types or variations of project procurement systems being widely used in the construction industry. They range from the traditional system to the many variations of "fast-tracking" systems such as turnkey, design and build build-operate-transfer, management contracting, cost-plus contracting etc. The introduction of many variations of project procurement system was induced by the quest for more efficient and speedier project delivery system and better project performance. They are innovations to the traditional delivery method aimed at meeting the changing demand of clients or customers.

The different procurement systems present have brought changes not only to the process and procedure of project delivery but also the aspects of management and organization performance has been described as "the degree of achievement of certain effort or undertaking". It relates to the prescribed goals or objectives which form the project parameters (Chitkara, 2005). From project management perspective, it is all about meeting or exceeding stake holders' needs and expectations from a project. It invariably involves placing consideration on three major project elements i.e. time, cost and quality. (Project Management Institute, 2004). It has been pointed out that, in today's highly competitive and uncertain business environment, the client who is the major stakeholder, want speedier delivery of their project with early start of construction work, certainty of performance in term of cost, quality and time, value for money for their investment, minimal exposure to risk and early confirmation of design and price or cost (Centre for Construction Strategic Studies, 1998). Although many tend to focus on the elements of cost, quality and time, all others are also important parameters of project performance.

As mentioned earlier, the introduction of different "fast-tracking" project procurement systems is the attempt by the industry to provide better deal to its clients or customers, who are increasingly insisting for "better value for money" from their projects in term of cost, time and quality. The different project procurement systems present different methods, process and procedure of designing and construction of projects for the client. These different systems also prescribe the variation of the organizational structure of the project teams in term of role, responsibility and authority. So how do the different procurement methods affect the project performance given that the method, process, procedure and organization vary according to the systems? This paper looks at the different procurement methods and procedure and their attributes and how each of them affects the performance of a project.

There are many procurement methods, as will be highlighted later, being used in the construction industry worldwide now days. However the focus is only on the type of procurement methods and systems that commonly used in Ethiopia now days. The parameters for the measurement of project performance are many, but in this case consideration is given to only three elements – time, including speed of delivery, cost and quality.

1.2 Statement of the problem

In the construction industry of Ethiopia, the construction of many facilities is growing fast as compared to few years back. Although that is true certain construction projects are performed below the intended quality and exceed the budget and completion time set. Among the many reason for such poor performance the procurement methods or systems is the one and basic part that need emphasis.

1.3 Objective

1. General Objective

- To assess the effect of procurement methods on construction project performance in Ethiopia.

2. Specific Objectives

- To investigate the different procurement methods applicable in Ethiopia.
- To identify and evaluate the understanding of how procurement methods and procedures affects project performance.
- To identify the major causes of poor procurement methods and procedures in the construction industry.
- To make recommendations and suggest remedial procedures.

1.4 The research questions

- Why many construction projects in Ethiopia performed below the quality set, above the budgeted cost and time set for?
- How a procurement methods and systems do influence the achievement of efficient governance of construction project?
- What a systematic and holistic approach to a procurement methods and procedures is crucial?

1.5 Significance of the study

The study will contribute valuable knowledge to the construction industry policy and regulation makers; the government especially the procuring entities may use the study to

develop or revise their policies and procedures on construction project procurement methods; improve contactor selection and; other researchers will use the same future research for literature review and for further studies in Ethiopia.

1.6 Research limitation

The following were the paper work limitations

- The study is concerned with major procurement methods for construction works only, and will not take in to account for the consultancy and works
- In Ethiopia certain clients have Engineering Department to implement construction projects and the other hire consultants. As those department and consultant represent the client, the paper will take in to consideration the opinions of two categories. Furthermore, this project work will not take in to consideration the opinion of other parties who involved in construction projects the like contractors, suppliers, stakeholders and regulators.

1.7 Structure of the project

This project has five chapters that discuss various aspects of the construction project procurement methods focusing on the main provisions that are relevance with this paper. Chapter one explains introduction of the research and spells out what the research intends to achieve. Chapter two review literature of the project that provides a general understanding of previous studies and theories related to the study area. This also provides certain bases for analysis of the main issues. Chapter three discusses the methods that are used for research and highlights data collection methods that the research employed. It is followed by chapter four which is dedicated to the analysis and discussion of the results obtained from the study. The last chapter draws conclusion of the project and provides some recommendations for improvement in the field. Further recommendations for future studies are also included in this chapter.

CHAPTER TWO

LITERATURE REVIEW

2.1 Definitions of procurement method

Rosil et.al., (2006) stated that the procurement of construction project is vast in scope because it involves the gathering and organizing of a lot of separate individuals, firms and companies to design manage and build construction products such as houses, office buildings, shopping complex, roads, bridges etc. for specific clients or "customers".

The Federal Democratic Republic of Ethiopia Ministry of Finance and Economic Development Public Procurement and Property Administration Agency (2011) defined procurement method as a procurement method is the technique that public body uses to acquire goods, works and services. The method selected depends on a number of factors including the type of goods or service being procured, the value of the good or service being procured, the potential interest of foreign bidders and even the cost of the procurement process itself.

Mathonsi and Thwala (2012) stated that Procurement method is a contemporary term, which is known to many practitioners and researchers of the construction industry by different terms; these include terms such as project approach, procurement systems, procurement delivery methods or project delivery systems, etc.

Masterman (2002) argues that there is a need to accept that contemporary procurement methods can now embrace not only design and construction, but also financing, operating, facilities management etc. The following definitions best define a procurement method

- It is an organizational structure adopted by the client for the implementation and at times eventual operation of a project,
- It is a key means through which the clients create the pre-conditions for the successful achievement of project-specific objectives,

- A procurement method (or sometimes known as procurement system) "is an organizational system that assigns specific responsibilities and authorities to people and organizations, and defines the various elements in the construction of a project".

2.2 Background for procurement methods history

Larmour (2011) stated that procurement methods remained relatively unchanged for over hundred years prior to the Second World War, with the main forms being traditional or conventional methods. Post 1945 many newer forms of procurement emerged and the use of different procurement methods changed over time. The rise and fall of the economy during the next fifty years has seen a number of different procurement methods fall in and out of favour depending on trends in the industry and changes in the project team structure.

Masterman (2002) stated that Pre-World War II (1939-1945) a majority of projects used traditional (or conventional) procurement. Post 1945 the variety of methods available increased, partly due to increase of imports, and partly willingness to try something new due to frustrations of the poor performance of the construction industry. Larmour (2011) classified evolution of procurement methods into main five phases which are

- **Phase 1: 1945 - 1972 – Sustained economic growth**

By the 1950"s negotiated tenders and Design and Build had begun to be used in a very limited scale by the private sector in developed countries. The Emmerson Report (Ministry of Works in UK, 1962) criticized the lack of cooperation between members of the project team and their clients, notably highlighting in no other important industry is the responsibility for design so far removed from the responsibility for production.

This period was still a general failure to adopt alternative methods of tendering. The early to mid 1960"s was a time of economic expansion, rapidly developing technology, changing social attitudes, demand for more complex and sophisticated buildings, and the increased need from clients for faster completion at minimum cost. These factors

generated considerable activity within the industry, a consequence of which was that the general standard of performance and organization improved. (Masterman, 2002).
In summary, this was a time of economic growth, with general use of conventional procurement methods, and only a small use of non-conventional procurement methods.

- **Phase 2: 1973 - 1980 – Recession**

This was a period of recession due to the unexpected and large price increases in crude oil, coupled with high inflation caused by the previous economic boom. Governments sponsored studies during this period tended to be specific to individual sectors.

In 1976, many reports found that the overall time to implement large industrial projects in the development countries, and the final cost considerably higher in all. The reason attributed to this was "an unnecessarily lengthy and complex design and pricing process, and the time taken to obtain statutory permits"
Masterman (2002) summarizes the theme of the 1970's reports reflected conservatism, as a diminishing number of clients were prepared to commit to projects in an uncertain economic climate.

- **Phase 3: 1981 - 1990 – Post recession recovery**

This was a period of post recession adjustment and recovery. Changes such as labour only sub-contracting emerged due to long term shifts in the structure of the industry. For example, the British Property Federation (BPF) launched a new procurement system "System for Building Design and Construction" in 1983.

Natasa (2007) stated that prior to the mid-1980s the mainstream of the construction industry in developed countries has followed traditional methods of procurement. One consequence of the above has been the global development of new, alternative procurement methods, which can be categorized, by the way in which the interaction between the design and construction of the project is managed, to integrated procurement systems, management-oriented procurement systems and, in more recent times, partnering.

- **Phase 4: 1991 - 2000 – Recession and recovery**

The early part of this decade saw low economic growth, uncertainty in business and finance, social pressures and environmental issues emerge. In addition to government capital spending cuts, there was little enthusiasm for major projects in the private sector. The results were a major downturn in the construction industry with more than 500,000 construction related jobs lost, and more than 16,000 construction companies becoming insolvent (Cox, et al., 1998).

In 1997, there were signs of recovery, but annual input was still 20% below 1990 levels. A number of problems to be tackled including the client's role, management of the project process, fragmentation of the industry, competitive tendering, the reputation of the industry and barriers to attracting the best people. During this period the use of design and build procurement method and management procurement method fluctuated, but with an overall increase compared to their use throughout the 1980's. There was also an increase in the use of partnerships and alliances.

- **Phase 5: Sustained economic growth, followed by recession (2000-2010)**

This decade saw continued growth with major projects constructed in the first half of the decade. The financial crisis towards the latter part of the decade resulted in recession from June 2008 – Dec 2009, the longest recession since the 1950's. During this decade, the growth period saw an increase in the use of construction management for large scale projects, and an increase in the use of design and build. This may partly be due to the requirement to bring new buildings to the market in very short timescales.

Larmour (2011) argues that the effect of the recession in the last few years of this phase is difficult to determine at present, however it appears to have caused an increase in use of design and build procurement method, and a more competitive market for consultant fees. The results of this are likely to be felt over the next few years in various parts of the construction industry.

2.3 Types of procurement methods

Davis et al., (2008) stated that a plethora of methods for procuring construction projects are available to meet the needs of clients. Deciding what method to use for a given project is a difficult and challenging task as client's objectives and priorities need to marry with the selected method so as to improve the likelihood of the project being procured successfully. The decision as to what procurement method to use should be made as early as possible and underpinned by the client's business case for the project. The risks and how they can potentially affect the client's business should also be considered.

Davis et al., (2008) classified procurement systems as the following two major methods

1. Traditional Procurement Method (Separated);
2. Non-Traditional Procurement Method which include the following three methods

A. Design and Construct Procurement Method (Integrated);

B. Management Procurement Method (Packaged); and

C. Public Private Partnership Procurement Method

Mathonsi and Thwala, (2012) stated that over the past number of years; the construction industry has undergone changes in a manner never seen before. The increased size and complexity of the construction projects, financial challenges, political and social consideration, and information technology are just some of the changes that have been taking place. These changes had led to the development of alternative procurement systems other than the famous traditional one. Although the development of non-traditional procurement systems seemed to be the favorite to most clients of the construction industry, It must, however, be emphasized that there is not yet a specific method used to select the most appropriate procurement method.

Natasa (2007) stated that many clients today, however, are increasingly dissatisfied with the traditional approach and its operational characteristics and actively seek alternative methods of procurement, organization and management to meet their increasingly complex demands**.**

Masterman (2002) defines a non-traditional procurement system as a diversified contemporary procurement system(s) that not only considers design and construction, but also considers financing, operating and facility management.

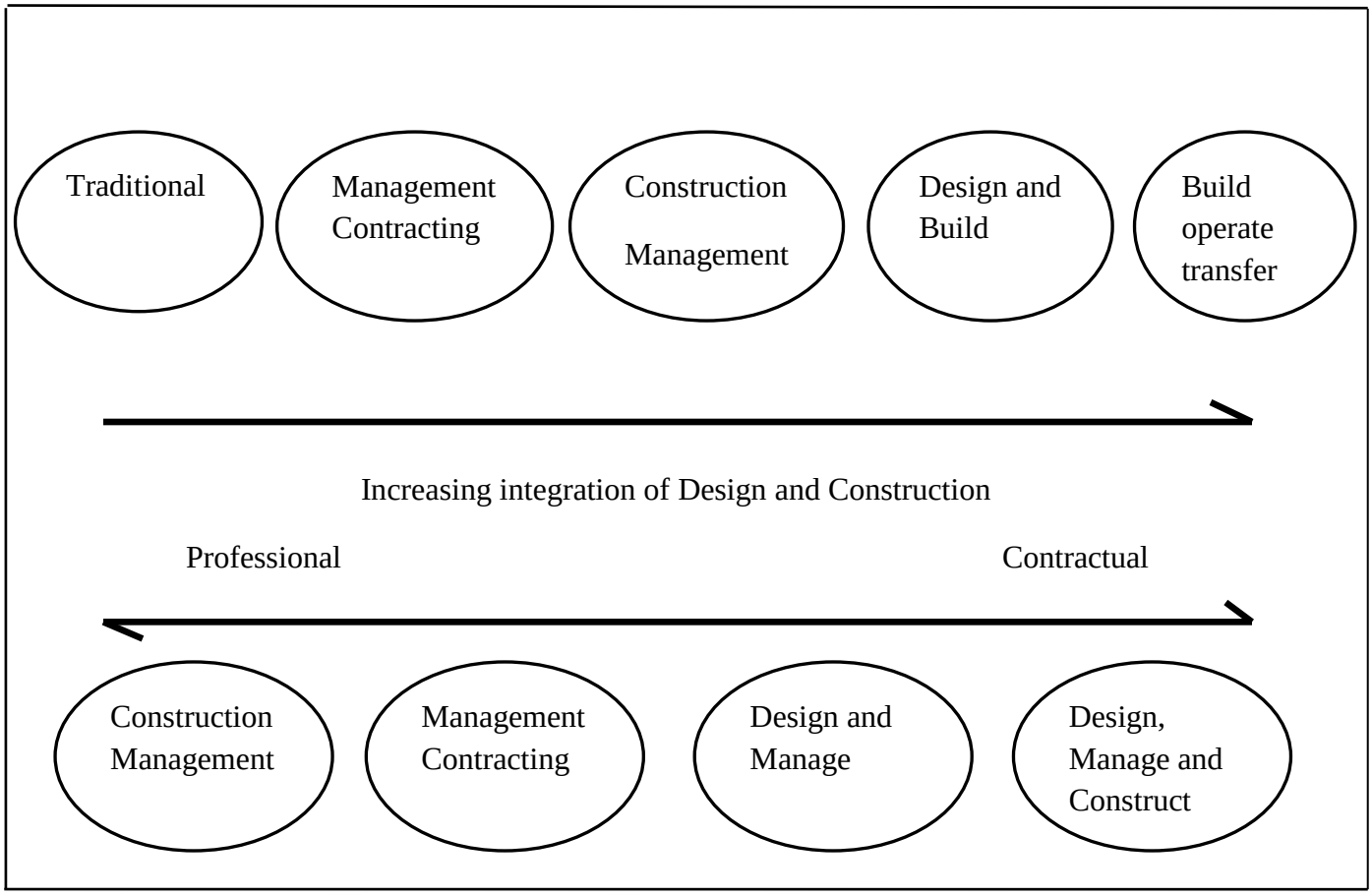

Figure 2.1: Procurement method characteristics, source: Rowlinson et al., (1999)

2.3.1 Traditional procurement method

Mathonsi and Thwala, (2012) stated that this method is called "traditional" because it has been in existence for a long time and has been the only choice available for most clients of the construction industry for many years. Using this method, the client enters into an agreement with the design consultant (an architect or engineer) to actually carry out the design work and prepare contract documents.

Following the completion of this phase, the contractor is then appointed based upon the owner's criteria and the owner enters into a contract with the successful contractor for the assembly of the project elements. In essence, the client is under two contractual obligations; the design professional and the contractor.

Larmour (2011) argues that this method is used to describe procurement which involves the client's design team producing a full construction design. The contractor will then tender for the construction of this package. Traditional procurement method usually results in maximum cost certainty for a project with a fully defined project, but a long programme as design and construction are sequential. It is also inflexible in terms of design changes, which will result in excessive cost and programme implications.

Davis et al., (2008) stated that in the traditional approach, the employer accepts that design work will generally separate from construction, consultants are appointed for design and cost control, and the contractor is responsible for carrying out the works. This responsibility extends to all workmanship and materials, and includes all work by subcontractors and suppliers. The contractor is usually appointed by competitive tendering on complete information, but may if necessary be appointed earlier by negotiation on the basis of partial or notional information.

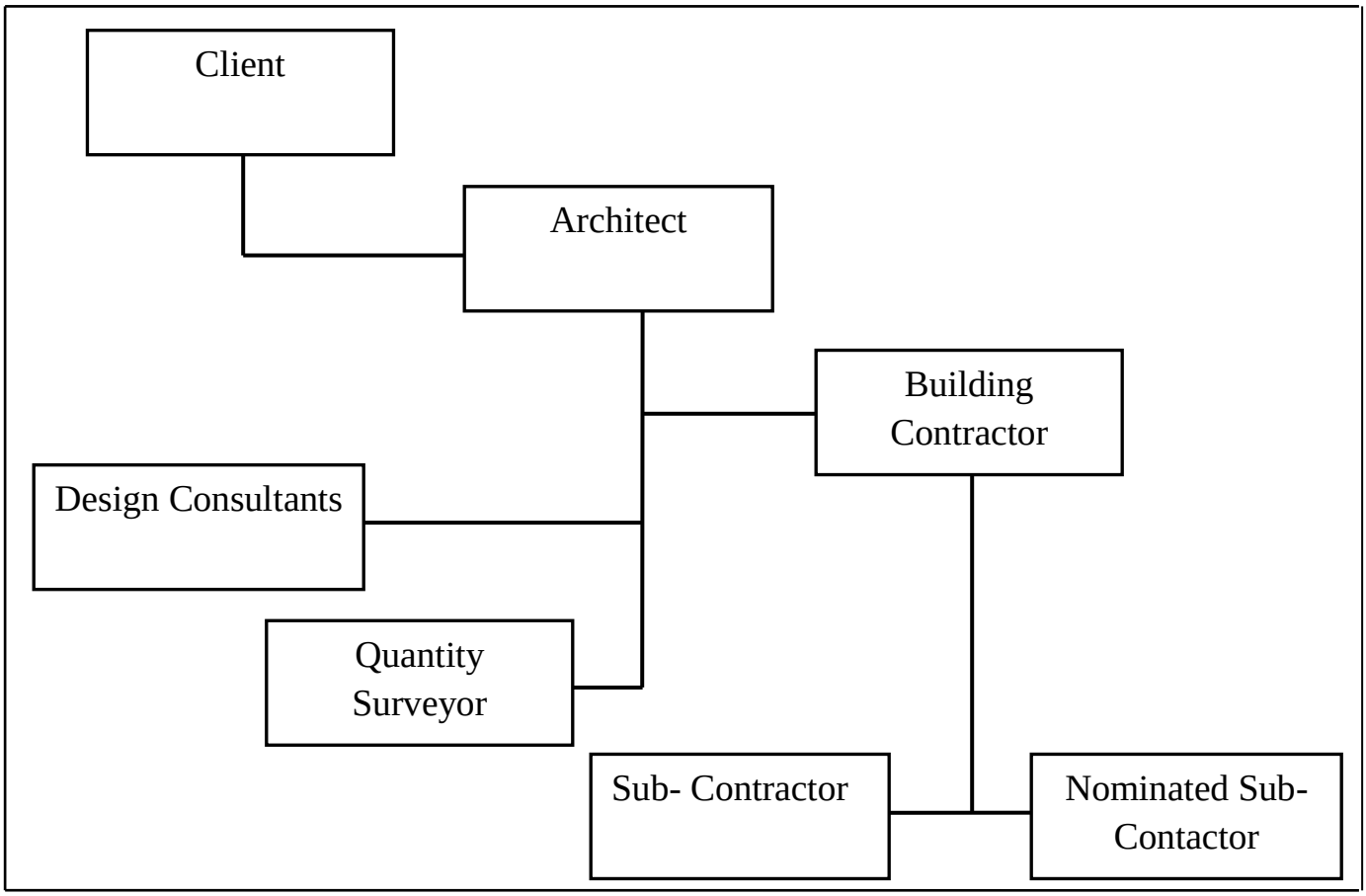

Figure 2.2: Traditional procurement method, source: Davis et al., (2008)

The Chartered Institute of Building CIOB report, (2010) illustrated that traditional method, has its weaknesses, as all other methods of procurement do. However, the construction industry has used the traditional process for so long that it has become the most understood**.** Indeed, it is likely that the simplicity involved in understanding traditional is its greatest strength – the designer is responsible for design and the contractor for execution, so responsibility for co-ordination of subcontract packages lies firmly with the contractor. While complications will inevitably arise, as with any procurement system, the traditional method sees each party knowing where they stand, and who has responsibility for what, weaknesses with traditional are, however, apparent.

The nature of separating the design and construction processes means disputes are common, and those delivering the project (i.e. the contractor) do not have much of a say

in the design, cost and allocation of risk. Indeed, some may say that traditional goes against the requirement for the industry to integrate further.

Davis et al., (2008) argues that the traditional procurement method, using two-stage tendering or negotiated tendering, is sometimes referred to as the "Accelerated Traditional Method" – this is where the design and construction can run in parallel to a limited extent. Whilst this allows an early start on site, it also entails less certainty about cost. There are three types of contract under the traditional procurement method

1. Lump sum contracts: where the contract sum is determined before construction starts, and the amount is entered in the agreement.
2. Measurement contracts: where the contract sum is accurately known on completion and after re-measurement to some agreed basis.
3. Cost reimbursement: where the contract sum is arrived at on the basis of the actual costs of labour, plant and materials, to which is added a fee to cover overheads and profit.

2.3.1.1 Lump sum contract method

Davis et al., (2008) stated that the contractor undertakes to carry out a defined amount of work in return for an agreed sum. This can be a fixed amount not subject to recalculation, in which case there would be no opportunity for the employer to make variations. The sum is likely to be subject to limited fluctuations, usually to cover tax etc changes not foreseeable at the time of tendering. The sum may be subject to fluctuations in the cost of labour, plant and materials – the so called fluctuations provision. Recovery may be use of a formula, or by checking invoices.

El Wardani (2004) stated that lump sum contracts with quantities are priced on the basis of drawings and a firm bill of quantities. Items which cannot be accurately quantified can be recovered by an approximate quantity or a provisional sum, but these should be kept to a minimum.

Lump sum contracts 'without quantities' are priced on the basis of drawings and another document. This may simply be a specification of a descriptive kind, in which case the lump sum will not be itemized, or one that is detailed to the extent that the contract sum

is the total of the price able items. The job might be more satisfactory described as a 'Schedule of Works', where the lump sum is the total of the priced items. In the latter cases, an itemized breakdown of the lump sum will be a useful basis for valuing additional work. Where only a lump sum is tendered, then a supporting 'Schedule of Rates' or a 'Contract Sum Analysis' will be needed from the renderer. Tenders can be prepared on the basis of notional quantities, but they will need to be replaced by firm quantities if it is intended to enter into a 'with quantities' lump sum contract.

Odeyinka et al., (2009) in a research conducted on the budgetary reliability of bills of quantities (BOQ) for procurement of construction projects, opined that the difference between the budgeted cost and the final cost incurred differed greatly depending on project type. This is supported by

Khumpaisal (2007) who focused on construction industry and opined that maximum possible risk to the contractor occurs in the lump sum contract in which the extent of the work is moderately well identified and the cost of the work is tendered as a non-possible change project.

Young (1993) viewed a lump sum contract as a contract where an agreed price has been determined for the execution of the work and performance of the obligations by the parties before the execution of the contract. Taroun et al., (2011) posited that risk assessment is probably the most difficult component of the risk management process; it is potentially the most useful. Since the project considered for this research were public project executed using lump sum contract and the gap noticed was that contractors do not have a definite way of taking care of inherent risks in their pricing system, they are only concerned about winning contract (Laryea and Hughes, 2009). This hinders the performance of not only the contractor but also the project as it is evident by the spate of abandoned projects and adversarial or acrimonious relationship project stakeholders 'exhibit (Aje, 2008).

2.3.1.2 Measurement contract method

Davis et al., (2008) argues that measurement contracts are also referred to as 're-measurement contracts'. This is where the work which the contractor undertakes to do

cannot for some good reason be accurately measured before tendering. The presumption is that it has been substantially designed, and that reasonably accurate picture of the amount and quality of what is required is given to the tenderer. Probably the most effective measurement contracts, involving least risk is to the employer, are those based on drawings' with approximate quantities.

Measurement contract method can also be based on drawings and a 'Schedule of Rates' or prices prepared by the employer for the tenderer to compete. This type of contract might be appropriate where there is not enough time to prepare even approximate quantities or where the quantity of work is very uncertain. Obviously the employer has to accept the risk involved in starting work with no accurate idea of the total cost, and generally this type of contract is best confined to small jobs.

Rosli et al., (2006) stated that the function of bill of quantity (BOQ) has not changed very much ever since it was introduced about hundred years ago. In the traditional procurement method, BOQ is used mainly for project costing and as part of tender document for soliciting competitive tenders from contractors. It is a uniform document for contractors to estimate or price the work on precisely the same basis, thus allowing for the fairest bidding.

2.1.1.3 Cost reimbursement contract method

Davis et al., (2008) illustrated that this type of contract sometimes referred to as "Cost Plus" contracts. The contractor undertakes to carry out an indeterminate amount of work on the basis that they are paid the prime or actual cost of labour, plant, and materials. In addition, the contractor receives an agreed fee to cover management, overheads and profit. Hybrids of the cost reimbursement contracts include

• Cost-plus percentage fee

The fee charged is directly related to the prime cost. It is usually a flat rate percentage, but it can also be on a sliding scale. However, the contractor has no real incentive to work at maximum efficiency, and this variant is only likely to be considered where the requirements are particularly indeterminate pre-contract.

• **Cost-plus fixed fee**

The fee to be charged is tendered by the contractor. This is appropriate provided that the amount and type of work is largely foreseeable. The contractor has an incentive to work efficiently so as to remain within the agreed fee.

• **Cost-plus fluctuating fee**

The fee varies in proportion to the difference between the estimated cost and the actual prime cost. The assumption is that as the latter cost increases, the contractor's supposed inefficiency will result in a fee which decreases. This approach depends upon there being a realistic chance of ascertaining the amount and type of work at tender stage.

Mathonsi and Thwala, (2012) stated that in order for the client to obtain a constructed facility, tenders from traditional procurement method are invited in one of the three following methods

• **Open tendering**

This is a procedure that allows practically any contractor to submit a tender for the work. This procedure involve either the client or consultant (on behalf of the client) placing a public advertisement giving a brief description of the work. Normally the client will require a cash deposit when contract documents are requested (Pilcher, 1992).

• **Selective tendering**

This consists of the client drawing up a shortlist of contractors that are known to have the appropriate qualifications to carry out the work satisfactorily. Those contractors who seek to be listed are then asked for further details concerning their technical competence, financial standing, resources at their disposal and relevant experience. Pre-qualifying contractors who are on the list are invited to tender (Pilcher, 1992).

• **Negotiated tendering**

This method is applied in several or different contexts, but the essence is that tenders are obtained by the client inviting a single contractor of his/her choice to submit a tender for a particular project.

Advantages and disadvantages of traditional procurement

The main advantages of using a traditional procurement method are

• Accountability due to a competitive selection;

• Competitive equity as all tendering contractors bid on the same basis;

• Design lead and the client is able to have a direct influence which can facilitate a high level of functionality and improve the quality in the overall design;

• Price certainty at the award of the contract;

• Variations (changes) to the contract are relatively easy to arrange and manage; and

• A tried and test method of procurement which the market is very familiar with.

The main disadvantages of using a traditional procurement method are

• Can be a timely process to produce the full contract documentation. Tenders documents from an incomplete design can be produced but can lead to less cost and time certainty, and may lead to disputes;

• Overall project duration may be longer than other procurement methods as the strategy is sequential and construction cannot be commenced prior to the completion of the design; and

• No input into the design or planning of the project by the contractor as they are not appointed during the design stage.

2.3.2 Non Traditional Procurement Methods

2.3.2.1 Design and construct procurement method

Masterman (2002) define the design and construct procurement method as "An arrangement where one contracting organization takes sole responsibility, normally on a lump sum fixed price basis, for the bespoke design and construction of a client's project".

Mathonsi and Thwala, (2012) stated that this method is a system where one organization, usually but not exclusively the contractor, takes responsibility for the design and construction of the project, in theory at least. The client deals only with one organization.

El Wardani (2004) stated that several definitions have been developed for the various design and construct teams procurement approaches. Molenaar and Gransberg (2001)

indicated that the fixed–price approach, located at one end of the continuum shown in Figure 2.3, takes into consideration only the price as the sole criterion for selection. Accordingly, the lowest bidder is awarded the contract in an approach very similar to the traditional general contractors' procurement.

In one-step procurement procedure, the design and construct team may be selected based on price only or a best value combination of financial and technical criteria. A two-step selection approach consists of a prequalification of the prospective design and constructs teams using a request for qualification (RFQ), followed by an evaluation of the price and technical aspects. This represents the "best value" approach and the weights given to each of the technical and financial criteria differs from one organization to the other. It is worth noting that management aspects, an organization's financial standing, in addition to previous design and construct team experience are also considered in a best value procurement approach (Molenaar and Johnson, 2001).

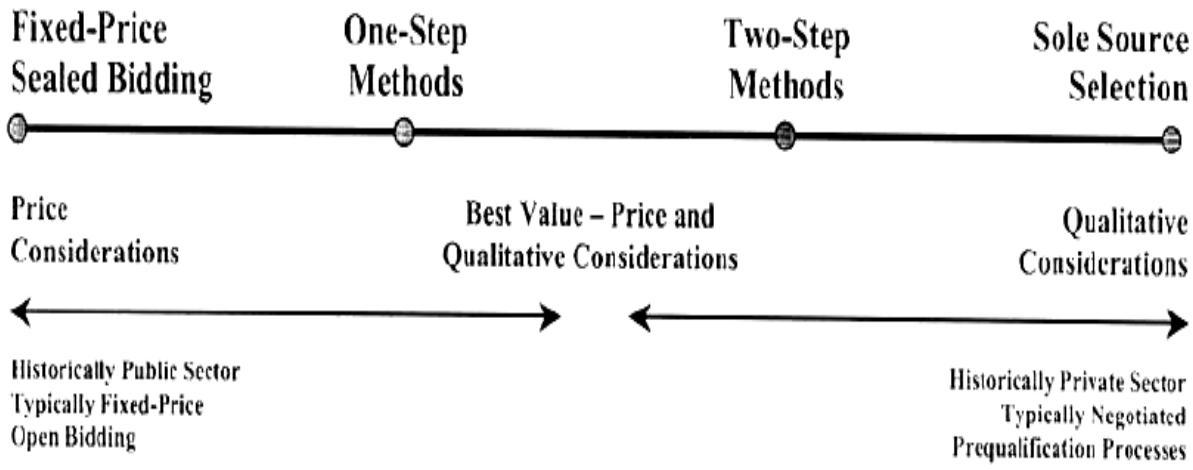

Figure 2.3: Selection methodology continuum, source: Molenaar and Gransberg (2001)

Davis et al., (2008) stated that with design and construct procurement method, a contractor accepts responsibility for some or all of the design. There should be express reference to this in the contract, and the extent of design liability should always be set out as clearly as possible.

Unless the contract states otherwise, it seems that the liability for design is an absolute liability under which the contractor warrants fitness for the purpose intended.
Some design and construct forms limit the design liability of the contractor to the normal professional duty to exercise reasonable care and skill. Independent consultants engaged by the contractor are therefore under a liability no greater than normal. An indemnity or acceptance of liability is likely to be worthless unless backed by adequate indemnity insurance, and this is something that should be checked before a contractor is appointed. If the contractor does not have in-house designers, which is often the case, and the contractor uses external consultants, their identity should be established before a tender is accepted.

The client's requirements might be stated briefly and simply, perhaps little more than a site plan and schedule of accommodation. On the other hand, they may be a document of several hundred pages with precise specifications. The contractor's input might be restricted to taking a scheme design supplied by the client and developing details and production information. It is however better to specify in terms of the performance requirement rather than to prescribe in detail, because this leaves the responsibility for design and selection firmly with the contractor.

Design and construct procurement methods offer certainty on the contract sum and bring cost benefits. The close integration of design and construction methods and the relative freedom of the contractor to use their purchasing power and market knowledge most effectively can provide a client with a competitive price. With a design and construct procurement method, it is possible ensure a quicker start on site, and the close integration of design and construction can result in more effective programming. Time, however, is needed by the client's consultants to prepare an adequate set of requirements, and time is needed to compare and evaluate the schemes from competing tenderers. Once a contract is signed, any changes by the client can prove costly.

The CIOB report (2010) illustrated that design and construct method is popular with clients, as the risk primarily lies with the contractor and the process is relatively easy to understand – the project is specified to be designed (at least in part) and construct by the same contractor, which, in theory, allows for greater communication. Other parts of the

design phase may be carried out by consultants hired by the client, though the contractor will be info-rmed of developments during the phase. It is not always as straightforward as this, and there can be numerous changes to the design in the construction phase, or a lack of communication between the two teams. Ideally, the design and construct stage would see both teams working in partnership, with the contractors giving feasibility input in the design stage, and the architect advising on site during the construction phase. Both would result in a more integrated approach, as set out in the Latham Report "Constructing the Team".

Natasa (2007) stated that the design and construct procurement system is the main number of the group. The principal variants are novated design and construct, package deal, develop and construct and turnkey methods of procurement

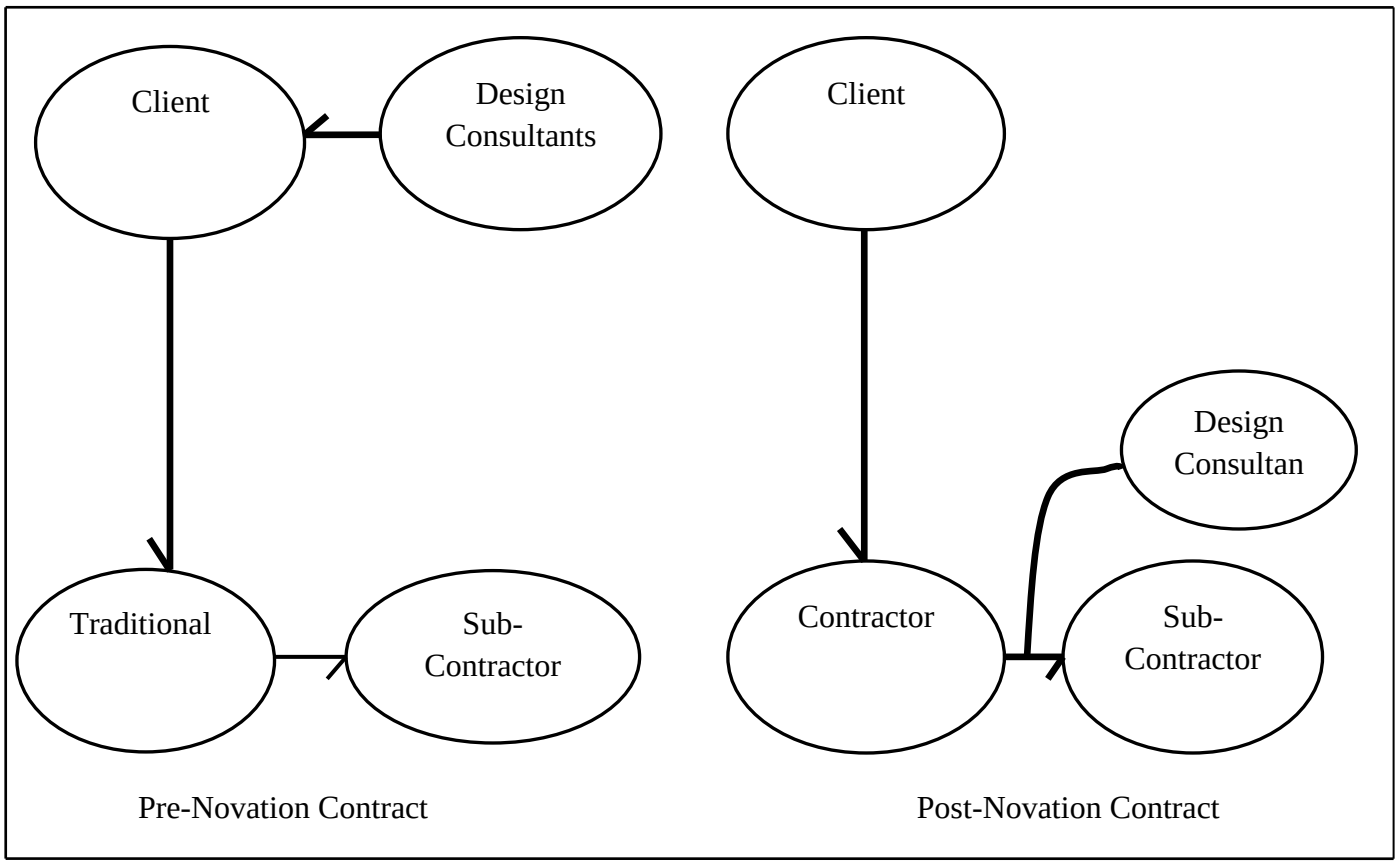

Figure 2.4: Pre and post-novation contracts, source: Davis et al., (2008)

Rowlinson (1987) suggested that design and construct/build contractors organize their activities in three different ways as the following

1. **Pure design and build**

The contractor strives for a complete and self-contained approach where all the necessary design and construction expertise resides within one organization that has sufficient resources to complete any task that arises. In such organizations, all aspects of design and construction have the capacity to be highly integrated.

2. **Integrated design and build**

In this form, a core of designers and project managers exists within the organization, but this type of contractor is prepared to buy in design expertise whenever necessary. Although more effort is needed to integrate the internal and external members of the design and build team, in-house project managers are employed to co-ordinate these functions.

3. **Fragmented design and build**

Many contractors, both large and small, and including national builders, operate a fragmented approach to design and build projects, whereby external design consultants are appointed and co-ordinated by in-house project managers whose other main task is to take and refine client briefs. Under this regime, many of the integration and co-ordination problems of traditional approach are likely to manifest themselves along with some role ambiguity among the professions as they come to terms with the builder as leader of the design and construction team.

Larmour (2011) stated that this method is used to describe procurement which involves contractor design and construction. It is generally associated with good cost certainty and a minimization of risk to the client. This method is often associated with programme benefits as design and construction can be overlapped. There are many variants within this category, such as Direct (when the designer/contractor is appointed following appraisal, there is no price competition); Competitive (when the price and design proposal are submitted based on the employers concept design); Develop and Construct

(part design to produce employers requirements, contractors complete and guarantee the design in competitive tender). Competitive is prevalent in current procurement, for example the building schools for the future programme.

Develop and construct is the most commonly referred to as 'Design and Build' in the private construction sector. Turner (1990) stated that a number of variations of design and construct exist, which include

1. Direct

In this case no competition is obtained in tenders. Some appraisal of the possible competitors may be made before tendering but only one tender is obtained.

2. Competitive

Tenders are obtained from documents that are prepared to enable several contractors to offer competition in designs and in prices.

3. Develop and construct

Consultants design the building required to a partial stage, often referred to as 'scope design', then competitive tenders are obtained from a select list of contractors to develop and complete the design and construct the building. The amount of consultant design can vary depending on the client's needs.

4. Turnkey

This method is often used where the contractors competing will use a significant part of their own or another proprietary building system or they will be constructing variations of a repetitive theme. There is limited scope for innovation when this method is used. Some contractors may offer to find a site, to sell, mortgage or lease their product, obtain approvals etc at a risk to themselves or at a charge to the client.

5. Novation

Sometimes referred to a design, novate and construct. This is where the contractor takes over from the client a previous contract for the design work, completes the design and

constructs the work. El Wardani (2004) classified the design & construct procurement method into the following procurement methods

1. Sole source selection

The sole source procurement method involves the direct selection of the design and build/construct team without proposals.

2. Qualifications-based selection

In a qualifications-based selection, the owner selects the most qualified design and construct team through an RFQ and often negotiates only with that entity to a "fair and reasonable" price. Selection of the team is primarily based on qualitative criteria such as past performance, design and build team reputation, technical competence and financial stability.

3. Fixed budget/best design selection

The fixed budget/best design is a procurement method where the owner specifies the project budget during the RFP process. The design and build teams compete by placing as much scope as they can in their submitted proposals. The design and build teams are selected based on qualitative and technical aspects.

4. Best value selection

The best value procurement method is an approach where the design and build teams respond to the owner by submitting proposals that are primarily evaluated based on the technical aspects together with the associated cost of the project. Negotiations may take place after the proposal submittals phase. The owner selects the proposal that offers the best value.

5. Low bid selection

The low bid is a procurement method where the owner primarily selects the design and builds team based on the project value and related cost items. Cost criteria represent more than 90% of the design and build team procurement selection process.

Advantages and disadvantages of design and construct procurement method

The main advantages of using a design and construct approach to procurement are

- Client has to deal with one firm and reduces the need to commit resources and time to contracting designers and contractors separately;
- Price certainty is obtained before construction commences as client's requirements are specified and changes are not introduced;
- Use of a guaranteed maximum price with a savings option split can stimulate innovation and reduce time and cost;
- Overlap of design and construction activities can reduce project time; and
- Improved constructability due to contractor's input into the design.

The main disadvantages of using a design and construct approach to procurement are

- Difficulties can be experienced by clients in preparing an adequate and sufficiently comprehensive brief;
- Client changes to project scope can be expensive;
- Difficulty in comparing bids since each design will be different, project programme will vary between bidders, and prices for the project will be different for each design;
- Client is required to commit to a concept design at an early stage and often before the detailed designs are complete; and
- Design liability is limited to the standard contracts that are available.

2.3.2.2 Management procurement method

Larmour (2011) stated that this method is used to describe procurement which involves a contractor providing management services. The two main variants of this are Management Contracting and Construction Management, which are both very different approaches. In Management Contracting, the contractor provides management services to control and coordinate all site activities, sub letting works to suitable contractors on a competitive basis. In Construction Management the client enters into separate contracts with the construction manager, designers, and trade contractors. Construction Management is generally associated with programme savings, and a higher degree of control for the client in terms of design quality, but less cost certainty.

Davis et al., (2008) stated that several variants of management procurement forms exist, which include; management contracting, construction management and design and manage. There are some subtle differences between these procurement methods. In the case of management contracting, the contractor has direct contractual links with all the works contractors and is responsible for all construction work. In construction management, a contractor is paid a fee to professionally manage, develop a programme and coordinate the design and construction activities, and to facilitate collaboration to improve the project's constructability.

a) Management contracting procurement method

The CIOB report (2010) stated that management contracting works by having a contractor managing a series of 'works' contractors or subcontractors. Advantages include early involvement in the project, and the management contractor can also appoint trusted subcontractors they have worked with previously rather than risk an unknown factor. Disadvantages include the lack of a single point of responsibility for both design and construction phases, which opens the possibility for disputes to arise.

The client appoints an independent professional team, and also a management contractor. Their involvement at pre-construction stages will be as adviser to the team, and during construction they will be responsible for executing the works using direct works contracts. With this type of contract it is possible to make an early start on-site and

achieve early completion. Because of its flexibility, it allows the client to change the design during construction because drawings and matters of detail can be adjusted and finalized as the work proceeds.

For a management contract to be successful there must be trust and good teamwork on the part of the client, the design consultants and contractor. The contractor should preferably be appointed no later than the outline design stage. The contractor can advise on the design programme, tender action, delivery of materials and goods, and construction programmes.

The management contractor is selected after a careful selection process and is paid a management fee. The basic difference is that works contracts, although arranged and administered by the management contractor, are direct between the client and works contractor. Although in a sense this gives the client a greater measure of control, it also means that the client accepts a considerable amount of risk. The management contractor is simply an agent, and usually cannot guarantee that the project will be finished to time and cost.

The management contractor will normally make a written submission which includes a proposed management fee, and will be appointed after interviews with the client and the design team. The fee will include for the total management service, expressed as a percentage of the total project cost, and for a service to cover pre-construction stages should the project not proceed to site.
The management contractor undertakes the work on the basis of a contract cost plan prepared by a quantity surveyor, project drawings, and a project specification.

b) Construction management procurement method

The CIOB report (2010) stated that construction management is not a widely used procurement method – its main reason for existence is for use on large and/or very complex construction works. The system works by having a construction manager as a point of contact, who will typically be head of a design team, who co-ordinates the project in terms of the various construction operations on site. Construction management

is generally considered to be the least adversarial form of procurement, and is often used when design needs to run in tandem with construction.

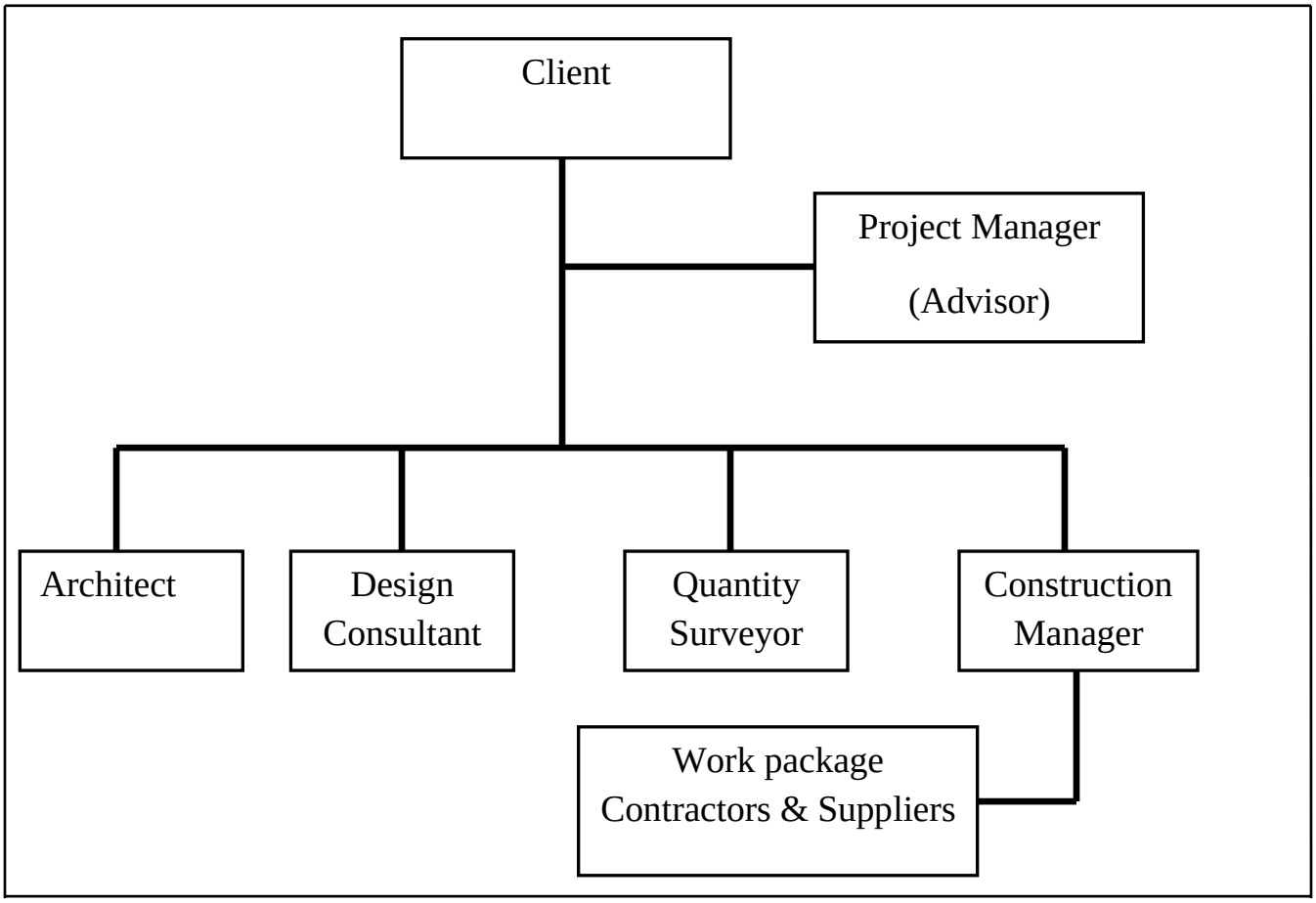

Figure 2.5: Construction management procurement method, source: Davis et al., (2008)

A number of advantages have been identified that can be offered by the CM approach. These may be summarized as follows (Walker, 1999);

• Reduced confrontation between the design teams and the team responsible for supervising construction;

• Early involvement of construction management expertise;

• Overlap of design and construction;

• Increased competition for construction work on large projects due to work packaging and splitting the construction activities into more digestible 'chunks';

• More even development of documentation;

• Fewer contract variations;

• No need for nominated trade contractors; and
• Public accountability.

Advantages and disadvantages of management procurement method

The main advantages of using a management approach to procurement are

• The client deals with only one firm, which enables improved coordination and collaboration between designers and constructors;
• Potential for time savings for the overall project as design and construction activities are overlapped;
• Under a design and manage form, the contractor assumes risk and responsibility for the integration of the design with construction;
• Works packages can be let competitively at prices that are current;
• Improved constructability through constructor input into the design;
• Roles, risks and responsibilities for all parties are clear; and
• Flexibility for changes in design.

The main disadvantages of using a management approach to procurement are

• Price certainty is not achieved until the final works package has been let
• Informed and proactive client is required.
• Poor price certainty
• Close time and information control required
• Client must provide a good quality brief to the design team as the design will not be complete until resources have been committed to the project (Construction management and management contracting); and
• Client loses direct control of design quality which is influenced by the constructors (design and manage)

2.3.2.3 Public private partnership procurement method "PPPP"

Larmour (2011) stated that public private partnership (PPP) procurement method involves two or more organizations working together to improve performance through agreeing mutual objectives, devising a way for resolving any disputes, and committing

themselves to continuous improvement, measuring progress and sharing gains and pains. Examples include framework agreements and joint ventures. This is a relatively new form of procurement and although discussed in the Latham report in the 1990's, has taken a long time to come into general use. It is more commonly seen within large civil engineering projects, than individual building projects.

The CIOB report (2010) believes that this method is the "most efficient way of undertaking all kinds of construction work including new buildings and infrastructure, alterations, refurbishment and maintenance". Long-term (strategic) partnering commitments showcase the real benefits of the procurement method, although short-term (project-specific) partnering has also proved highly beneficial on individual projects. Under this procurement method, the client lays down a framework for the overall administration of the project within which he/she has the discretion to use the most appropriate of all the procurement systems contained within the other three methods.

In PPP procurement method quantity surveyors play an integral role by providing a wide range of services, which include contractual issues; it also offers quantity surveyors an opportunity to act as independent advisors within the system (Cartlidge, 2002).

The principles of this method include a decision making process, mutual objectives, and an overall improvement in performance. As more projects are worked on in tandem, a greater understanding of how to accomplish best practice, reduce costs and attain value for money is achieved.

2.4 Factors affecting the selection of procurement method

As reviewed in the literature part, the different procurement methods now available has partly made clients' decisions to adopt any of the method for any given project complex task to grapple with. Various factors have to be taken in to consideration before any informed decision can be made on the right procurement choice. The factors can be classified in to two groups (Love et.al, 1998; Luu and Chen, 2005; Ratnasabapathy et.al, 2006)

- External environment such as economics, politics, finance, legal nature disasters, technology factors and;
- Internal environment which can be divided under three main factors; project characteristics, client's characteristic and client's requirement.

Client requirements can be sub-divided into cost related factors, time related factors and quality related factors. All these factors and their relationships have been nicely summarized by Ratnasabapathy et al. (2006) in Figure 2.7 below. The figure shows how the factors relate and interrelate with each other, which go to explains how the task involved in selecting the right procurement method can be extremely complex and difficult. The nature of the selection process therefore calls for employment of sound systematic procedure by clients. Such approach is likely to yield the best procurement method that best meets the needs for a particular type of works (Ali et al., 2011).

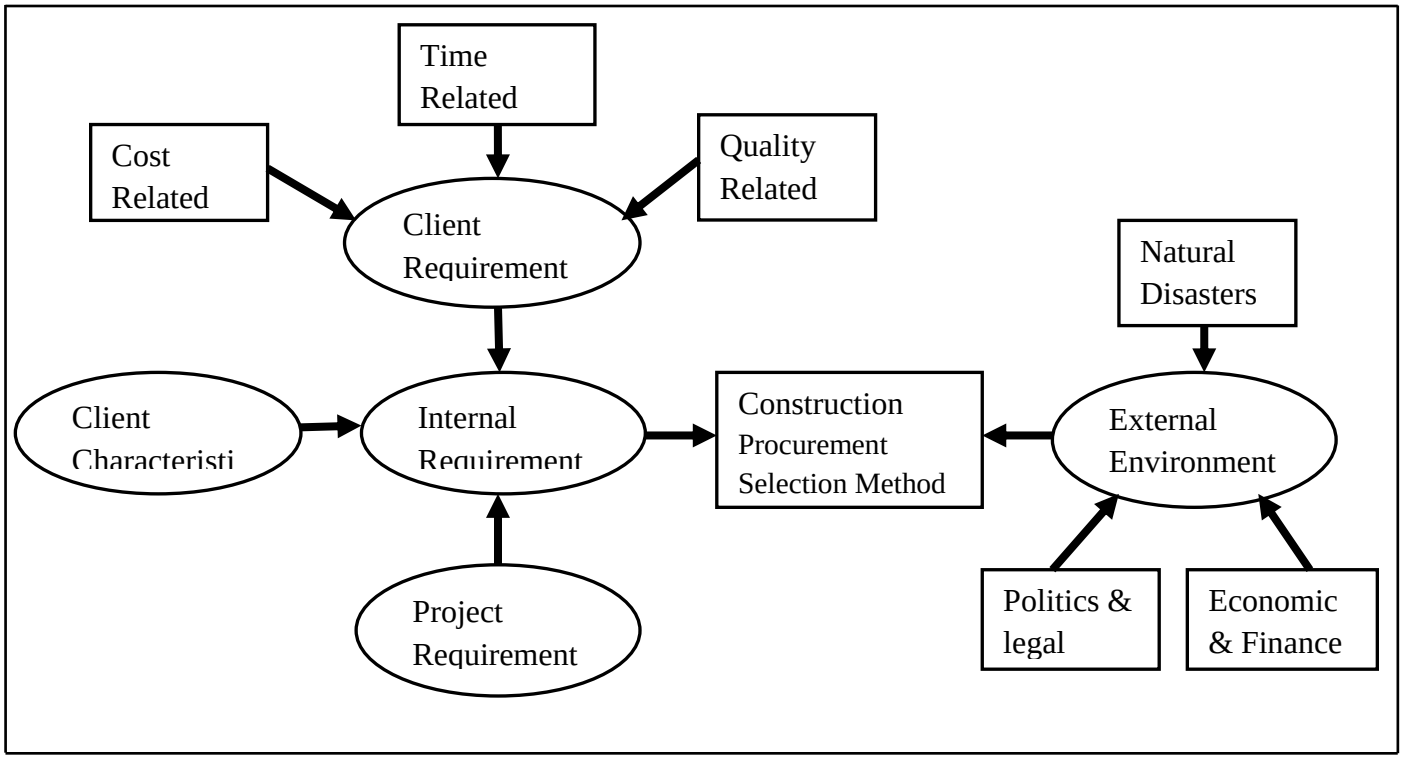

Figure 2.6: Factors effecting selection of a procurement Method (Source: Ratnasabahathy et al., 2006)

Maizon et al., (2006) presents the various factors influencing the selection of procurement systems in the Malaysian construction industry. The selection criteria that are identified as the most common criteria influencing the choice of procurement method are time, controllable variation, complexity, quality level, price certainty, competition, responsibility division, risk avoidance, price completion, government policy and client's familiarity in a procurement method.

Shiyamini et al., (2007) focused on the selection criteria in terms of client requirements, project characteristics, and external environment, thus ensuring that the selection criteria have been focused at macro level. The results of factor analysis revealed nine significant factors from client requirements which are risk management, time availability and predictability, price certainty, price competition, accountability, flexibility for changes, quality of works, responsibility and parties' involvement, and familiarity. Six factors from the project characteristics which are project cost and funding method, project complexity, project type, time constrains, degree of flexibility, and payment modality.

The choice of variants of the non-conventional procurement system is made in order of consideration of quality assurance; and a consideration of either project completion at estimated time or the consideration of the nature of the project. Project completion at estimated cost; minimization of construction time; minimization of design time are also considered as major factors in making choice of the variants of the non-conventional procurement method, indicating that much more factors are considered in making choice of the variants of the non conventional procurement method than the variants of traditional procurement methods in Nigeria.

Odhigu et al., (2011) explains that the procurement strategy is the outcome of a series of decisions which are made during the early stages of a project and it is one of the most important decisions facing the project client. No single procurement system can be applied universally on all construction projects. Each procurement system is chosen for a particular project based on certain criteria which use in the selecting procurement systems

Rosli et al., (2006) mentioned that it is very important at the very outset of the project to carefully consider all factors when selecting the most appropriate procurement approach

for a construction project. This is because each system has its own feature and peculiarity that will have effect on the cost, time and quality of the project i.e. the project performance.

Measurements are based on the principles of measurement (International). It was pointed out that their use has not only provided the client with the benefit of lump sum bid, but also a document for his own financial control.

Thomas (2001) illustrated that the selection and use of an appropriate procurement system is crucial to project success. The results indicate that there are nine procurement selection criteria commonly used by Australian clients: speed, time certainty, price certainty, complexity, flexibility, responsibility, quality level, risk allocation and price competition. Only time certainty and price certainty were seen by the respondents as unambiguous criteria, as the completion date and price can be objectively predicted by the client beforehand.

Shafik and Martin (2006) investigate favored procurement methods and the factors which influence their selection for house building in Scotland. The outcomes and experience gained highlight the fact that many factors have an effect on the selection process. Speed and level of quality is the greatest factor followed by client experience, then the project nature, and finally level of risk and cost.

Mahon (2011) confirmed that the procurement selection parameter of client requirement for budget/cost requirements was universally rated as the single most influential parameter on procurement route selection. This was closely followed by client requirement for on time completion. These two parameters were clearly rated as being the most influential in terms of procurement selection. The next most influential parameters were client experience and client requirement for in terms of value for money.

Abu Bakar et al., (2009) mentioned that among the most important factors in Aceh rehabilitation and reconstruction in procurement stage are timing, responsibility, and quality. The local authority, local community and contractors were involved in the implementation of the procurement method in term of participation, approval, supervision

and implementation. These factors are necessary to guaranty the handover of the projects to the client in accordance to the contract.

Type of project and approval from local authorities are other factors that contributed to time overrun in procurement selection. In the procurement implementation, factors, which can cause possibility in changing the initial design, are location, material, weather, and the worker from the community.

Mortledge et al., (2006) summarized that the following factors should be borne in mind when determining the most appropriate procurement method are

- External factors: consideration should be given to economic, commercial, technological, political, social and legal factors when selecting a procurement method
- Client characteristics: a client's knowledge and experience with procuring construction projects will influence the procurement method adopted. Procurement selection is influenced by the culture of the organization and the degree of desired client involvement
- Project characteristics: the size, complexity, location and uniqueness of the project should be considered as this will influence time, cost and risk.
- Ability to make changes: changes in projects are inevitable. The desired level of flexibility for the client to make changes during the project will influence the selection of a procurement method
- Cost: an assessment for the need for price certainty prior to commencement of construction by the client should be undertaken. If price certainty is required, then design must be complete before construction commences and design changes minimized.
- Time: most capital works project is required within a specific time frame. If early completion is a critical factor then a procurement method that supports speedy completion may be favored.

Love et al., (2008) illustrated that the selection criteria that the first focus groups identified as being important criteria to be considered during the procurement selection

process were: project value, project complexity, project type (standard/novelty), location (regional/local), stakeholder integration, political considerations, client needs, and industry culture. Surprisingly, political considerations and the prevailing industry culture were issues that participants wanted to discuss.

It was perceived that the selection of a procurement method was often a fait au complaint for the agency. This is because of the requirement for cost certainty and the issues associated with probity and accountability, and thus deemed to be transparent features the traditional procurement process. It was stated by one participant that "Factors such as project value, project complexity, and project type are a given. We know from our own personal experience that traditional lump sum methods always work and give us cost certainty. When it's a complex project or it needs to be done quickly we may consider construction management. The biggest issue we have is that often it's decided from above because it's the flavor of the month"**.**

The selection of project procurement strategy should necessitate robust analysis of project environment, in terms policies, available resources, risk associated, technicality, and preferred contractual arrangements amongst all parties towards devising a method of project implementation and to achieving project goals of time, cost and quality.

2.5 The decision to select procurement method

Davis et al., (2008) stated that the decision as to what procurement system to use should be made as early as possible and underpinned by the client's business case for the project. The risks associated with each procurement system and how they can affect the client should also be considered. With this in mind, Figure 2.7 provides an overview of the "speculative risk" (i.e. risk that can be apportioned in advance as decided by parties in a contract) to a client and contractor for specific procurement methods.

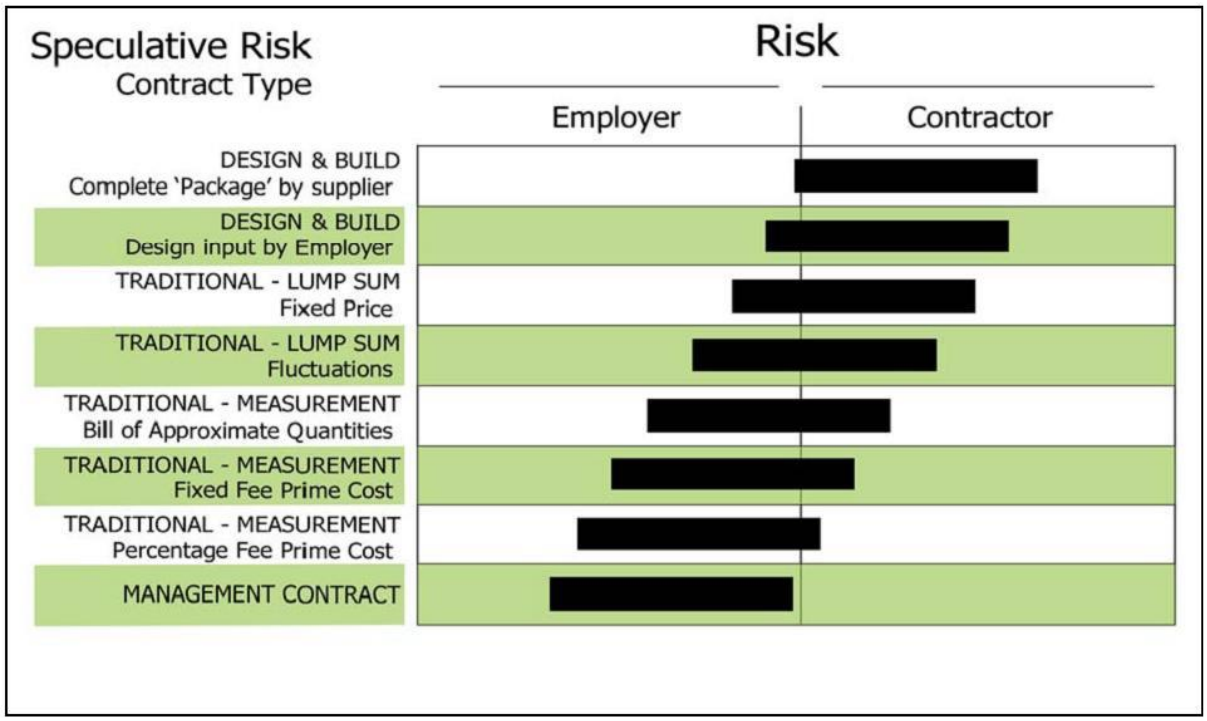

Figure 2.7: Risk apportionment between client and contractor, source: Davis et al., (2008)

In design and construct forms of procurement, the contractor predominately assumes the risk for design and construction of the project. Design and construct variations exist where the level of design risk can be apportioned more evenly, for example, novation. With traditional lump sum contracts the intention is that there should usually be a fair and balance of risk between parties. The balance can be adjusted as required, but the greater the risk to be assumed by the contractor, the higher the tender figure is likely to be. With management forms of procurement the balance of risk is most onerous for the client as the contractor is providing only „management expertise" to a project. However, under a design and manage method a high of risk can be placed on the contractor for design integration.

2.6 Project performance criteria and its measurement

Traditionally, a project is considered to have achieved a high level of performance if it is delivered at the right time, right price and good quality level. It should also provide the client with a high level of satisfaction. Bryde and Brown (2004) concluded that the

traditional distinction between good and poor project performance focused on the meeting of cost, time and product quality-related criteria.

These criteria have been described as the iron triangle of project performance. Figure 2.8 shows the iron triangle as adopted by Atkinson (1999)

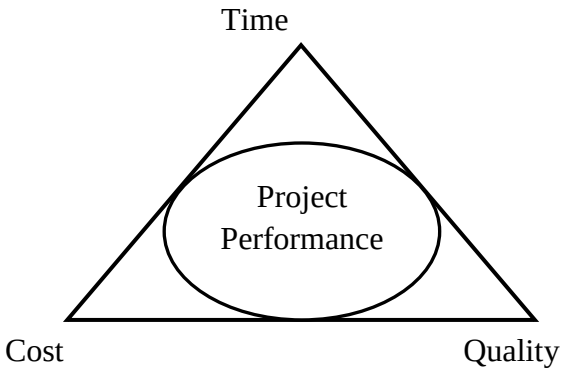

Figure 2.8 Project Performance Criteria trade- off triangle (Source: Atkinson, 1999)

Project success is usually measured differently from the perspectives of the different parties. Jing et al. (2010) compared success criteria as measured by contractors and clients and found out that clients put more emphasize on satisfying the needs of other stakeholders, while contractors emphasis on minimizing project cost and duration. They also found that all project stakeholders put products satisfying owner's needs as the first criteria.

In last decades, several researchers within the multidimensional construct of project performance have proposed different criteria or indicators based on empirical research. While some focused on using these measures as strategic weapons, others emphasized the proper delineation of the measures and groupings into classes that will make tracking and management reasonable. Most of the studies (see for example, Bassioni et al., 2004; Jin et al., 2007; Cheung et al., 2004) agree that project performance can be measured and evaluated using a large number of performance indicators or criteria but time, cost and quality appear to be the three commonly preferred performance evaluation dimensions.

2.7 Procurement methods applicable for construction project in Ethiopia

2.7.1 Choice of procurement method

The Proclamation and Directive and the Manual assumes that the public body is able to exactly spell out the object of procurement and can specify it in detail in the Bidding Documents and the technical specifications. Otherwise, procurement proceedings shall not begin until such time as the public body has been assisted to prepare a satisfactory technical specification against which bids shall be invited. The following sections describe the choice of procurement methods.

The following six methods of procurement shall be used in public procurement:

_ Open Bidding

_ Request for Proposals

_ Two-Stage Bidding

_ Restricted Bidding

_ Request for Quotations; and

_ Direct Procurement/ Single -Source procurement

2.7.1.1 Open bidding method

Under open bidding method, all interested firms bidders are given adequate notification of contract requirements and all eligible bidders are given an equal opportunity to submit a tender. The public body must give sufficient public notification of bidding opportunities to potential bidders to determine their interest and prepare bid documents. The Open Bidding Method is the preferred method of procurement of goods, works and services (Consultancy and Non Consultancy), unless the threshold levels or circumstances relating to a specific requirement make it more appropriate for one of the other procurement methods to be used.

A public body may use a procurement method other than Open Bidding Method only in accordance with the requirements set out in Proclamation and Directive. These methods cover Restricted Bidding Method, Direct Procurement Method, and Two-Stage Bidding Method and Request for Quotations Method. The selection of any procurement method

other than Open Bidding should be recorded in the Records of procurement, stating the reasons and justification for the method selected, in compliance with the conditions specified in the relevant Proclamation and Directive.

The procurement method applicable for a package shall be indicated in the procurement plan. The head of a public body may request for permission from PPA under exceptional circumstances, to use a procurement method other than Open Bidding for reasons not covered by Proclamation and Directive. Such decisions shall be justified on technical and/or economic grounds. A similar procedure to that set out above shall be followed to record the decision, except that a specific reason other than those specified in Proclamation and Directive shall be clearly provided (e.g. technical and/or economic justification) and the decision shall be approved by the head of a public body.

Directive provides threshold values which govern the use of procurement methods other than Open Bidding Method. Threshold value refers to the total value of each procurement transaction or package. If the procurement period is more than one financial year, then necessary budget provision should be made for each financial year, without splitting the package. Procurement Plan will show the procurement package and its total value. In case of procurement using Framework Contract, threshold values shall correspond to the estimated total contract value under that Framework Contract.

2.7.1.2 Conditions for use of restricted bidding method

The restricted bidding procedure is a two-stage procedure where bidders express their interest following publication of a procurement notice, but only those invited by the public body may submit bids after a screening process. Thus the restricted procedure consists of two distinct stages - selection of suitable bidders and evaluation of bids. At the first stage, the only criteria which may be used to select prospective bidders are economic and financial standing or technical knowledge or capability of carrying out a specific assignment. The restricted procedure works best where the public body is clear at the start of the process as to what it wants to procure, in terms of pricing and other award criteria.

A public body may undertake procurement by the Restricted Bidding Method:

· When goods and related services and works and physical services, because of their specialized nature, are available only from a limited number of Suppliers or Contractors. (e.g. aircraft, locomotives, specialized medical equipment, contraceptives, telecommunications, silos, ports and harbors, etc).

· The cost of procurement does not exceed the threshold specified in respect of restricted bidding in the Directive.

· Where a repeated advertisement of the invitation to bid fails to attract bidders in respect of a procurement subject.

· Conditions for use of Restricted Bidding Method shall be considered as being fulfilled if the estimated value of any contract of goods and related services and works and physical services to be procured is within the threshold values specified in the Directive and summarized in Appendix 1**.**

2.7.1.3 Conditions for use of direct procurement method

Direct procurement happens when the public body, for some justified reasons, procures goods, works or services from only one source. A public body may use Procurement Method for procuring goods and related services, works and physical services and intellectual and professional services directly from one single source without going through all the requirements of a full bidding process. However, this method shall under no circumstances be used as a means of avoiding competition or for favoring any one particular Bidder/Consultant or for creating any scope of discrimination among Bidders/Consultants. The conditions for use of direct procurement may be summarized as:

i) Small value contract,

ii) Availability of only one single source,

iii) Extension of existing contract;

iv) For compatibility reasons;

v) and emergency situations;

The head of a public body shall strictly control the Direct Procurement Method in order to ensure that there is no abuse and that its use is only where conditions specified in the Proclamation and Directive is satisfied. A decision to use Direct Procurement Method shall be approved in writing by the head of a Public body or an officer authorized by him/her. The circumstances in which a public body is allowed to use direct procurement are detailed below.

· When in absence of competitions for technical reasons the goods, works or services can be supplied or provided by only one candidate and the quality and technical competence of such candidate is so superior or unique that it cannot be

Directive 23.3: Conditions for use of restricted bidding

The total contract value of Procurement made by restricted bidding, in accordance with Article 49.2 of the Proclamation shall not exceed the following:

1. for procurement of works Birr 2,000,000.00;
2. for procurement of goods Birr 500,000.00;
3. for procurement of consultancy services Birr 300,000.00;
4. for procurement of services Birr 400,000.00. matched by any other candidate operating in the same field of activity. Such direct procurement shall be restricted and be undertaken only with the approval of the head of a public body.

· For additional deliveries of goods supplied by the original supplier which are required as:

- partial replacement of existing supplies, services or installations;
- as an extension of existing supplies, services or installations; or
- Where a change of supplier would result in the procurement of equipment, spare parts and/or services which would not be interchangeable with the existing equipment, spare parts and/or services.

· Within limits defined in the Directive, when additional works, which have not been included in the initial contract have, through unforeseeable circumstances, become necessary since the separation of the additional works from the initial contract would be difficult for technical or economic reasons.

· Within limits defined in the Directive, for new works which is a repeat of similar works which conform to a basic project of which the initial contract has been awarded on the basis of open or restricted bidding.

· Within limits defined in the Directive, for continuation of consultant services, where the original contract has been satisfactorily performed and the continuation of the original contract is likely to lead to gains in economy and efficiency.

· the head of the public body has determined that the need is one of pressing emergency in which delay would create serious problems and therefore injurious to the performance of that public body; where situations arise in which shopping becomes necessary to meet the special procurement need of public bodies;

· For purchase of goods made under exceptionally advantageous conditions which only arises in the very short term. This provision is intended to cover unusual disposals by firms, which are not normally suppliers. It is not intended to cover routine purchases from regular suppliers

· The additional procurement undertaken shall be approved by the same authority that approved the original procurement proposal, always provided that the head of a public body, or an officer authorized by him/her, had approved the use of Direct Procurement Method. The additional procurement shall not be allowed for more than one occasion for each contract. However, if under exceptional circumstances of the nature of force majeure, further additional procurement is required, then the public body shall seek direction from the PPA.

A public body may also use Direct Procurement Method for the purchase of readily available standard low value goods and unforeseen urgent services, e.g. catering services, ambulance services, transportation services, event management services, small repair/maintenance services, plumbing services, carpentry services, masonry services, painting services, etc., provided the contract value does not exceed the amount specified in Appendix 1. The Direct Procurement Method shall be undertaken in the manner prescribed in the Proclamation and Directive and the reasons for the selection of this method shall be documented in the records of procurement.

2.7.1.4 Conditions for Use of Two-Stage Bidding Method

A two-stage bidding method is used when the procurement process is split into two phases. The first phase identifies suitable candidates, who are then invited in the second phase to submit their firm bids.

A public body may use the two-stage bidding method in accordance with the requirements set out in Proclamation Article, 57 and 58 and Article 19 of the Directive in the case of large or complex contracts of goods and related services and/or works and physical services, such as turnkey contracts for manufacturing process plants, e.g. the design, construction, installation of equipment and commissioning of a new factory, industrial plants or the procurement of major computer and communications systems or construction and commissioning of a public institution. Under this method, the bidding have to follow two-stages, First-Stage and Second- Stage.

The use of the word 'complex' in describing the nature of the items to be procured under Two-Stage Bidding Method covers procurement objects for which it may not be in the best interests of the public body to prepare complete technical specifications in advance because of rapidly changing technology. This could also be in situations when the public body may not be capable of preparing a full technical specification because alternative technical approaches may be available, but not within the

Directive Article 25.7:

(a) Pursuant to the provision of article 51.2 of the Proclamation public bodies may carry out directly from any supplier, procurement of goods or services not included in their procurement plan, or goods or services necessary to solve problems encountered during travel the value of which doesn't exceed Birr 1,500 (one thousand five hundred Birr) however, the total value of such small procurements within a fiscal year shall not exceed birr 30,000.00 (thirty thousand Birr)

(b) Notwithstanding the provision of sub-article (a) above, diplomatic missions of the Ethiopian Government may carry out procurements of emergency requirements not included in their procurement plan and the value of which does not exceed USD $300 (three hundred USD) in a single purchase order. However, the total value of such small

procurements within a fiscal year shall not exceed USD $6000.00 (six thousand USD). knowledge of the public body. In such circumstances, it is better for the public body to learn from Bidders about the most appropriate, fit-for-purpose solution to meet its procurement requirements.

Subject to the provisions of article 57 and 58 of the Proclamation, procurement made by means of two stage bidding shall be carried out in accordance with the procedures set forth for national or international competitive bidding, as the case may be, in article 16 or 17 of this Directive respectively.

Notwithstanding the provision of article above, the following bid procedures shall apply in respect of two stage bidding:- It shall be stated in the invitation to bid that the procurement shall be carried out by means of two stage bidding, Candidates shall not be required to furnish bid security during the first of the two stages bidding, Since the purpose of the first stage is to draw up detailed schedule of requirements based on proposals from candidates, the bidding document prepared by the Public Body for the first stage shall state the requirements of the Public Body in general terms and incorporate the necessary description and questionnaires.

The technical proposal submitted by candidates during the first stage shall be opened in the absence of the candidates in the manner stated in the invitation to bid.
The first stage evaluation shall focus on examining the proposals submitted by candidates at the first stage to identify the schedule of requirements necessary and the bidders qualifying for the second stage bidding. During the first stage evaluation, the Public Body may also hold discussion with all, some or one of the candidates as necessary. The discussion to be conducted accordingly shall aim at creating better understanding of and develop the proposal/proposals submitted by the candidates.

The bidding document to be proposed for the second stage bidding shall as far as possible comply with the procedure of competitive bidding set forth in article 16 & 17 of this directive.

Invitation shall be sent to the candidates whose proposals have been accepted in the first stage bidding to participate in the second stage bidding. Such bidders shall be required to furnish bid security.

The Public Body shall send to such bidders or require them to collect in person the bidding document prepared for the second stage bidding. The invitation to bid sent to the candidates pursuant to article 4.1.6.7 above shall state clearly the requirements they have to fulfil to obtain the bidding documents.

2.7.1.5 Conditions for use of request for quotations method

Sometimes referred to as shopping, request for quotations method is used to buy items of low value. A public body may undertake procurement by means of a Request for Quotations (RFQ) in accordance with the requirements set out in Proclamation and Directive for the purchase of readily available, standard off the shelf goods or for procurement of works or services for which there is an established market, so long as the estimated value of such procurement shall not exceed the prescribed threshold value as given in Article 24.2 of the Directive and Appendix 1.

The head of a public body shall strictly control the use of RFQ as a method of procurement in order to ensure that there is no abuse and that its use by public bodies is restricted to the items specified in the Proclamation and Directive. A decision to use the Request for Quotation Method shall be approved in writing by the head of a public body, or an officer authorized by him/her. In deciding and/or justifying the use of the RFQ method in public procurement, the following shall be considered:

There is a risk of abuse in procurement under RFQ. The use of this method shall be restricted to cases when the justification for it cannot be disputed. Public bodies may not use RFQ as a means to either by-pass more competitive methods of bidding or split large procurements into smaller ones solely to allow the use of RFQ, as stated in the Proclamation and Directive.

Proclamation Article 57: Public bodies may engage in procurement by means of two-stage bidding:

1. When it is not feasible for the public body to formulate detailed specifications for the goods or works and in the case of services to identify their characteristics and, in order to obtain the most satisfactory solution to its procurement need;
2. When the public body seeks to enter into a contract for the purpose of research, experiment, study or development except where the contract includes the production of goods in quantities sufficient to establish their commercial viability or to recover research and development costs;
3. Where bid proceeding are initiated but no bids are submitted as a result of the nature of the object of procurement not being clearly described or where all bids are rejected due to failure on the part of the public body concerned to draw up a clear and complete specification;
4. Because of the technical character of the required goods or works or because of the nature of the consultancy or other services it is necessary for the public body to negotiate with the suppliers.

RFQ is a method that should not require complex documentation or all the formalities of a full Bidding process. It is, therefore, an appropriate method only for procuring readily available, off-the-shelf goods or standard specification commodities which are small in value and/or routine low value related services, physical services or stand alone services, e.g., catering services, courier services, security services, transportation services, printing services, etc. When the nature of the specifications is complex or the type of procurement requires an elaborate, detailed evaluation system (e.g., efficiencies, delivery times, etc.), that needs substantial documentation, open Bidding shall be used and not the RFQ method.

The public body shall put in place an operational mechanism reflecting a clear segregation of duties for the procurement officers executing the RFQ Method, whereby the procurement officer who invites and receives quotations shall not open it. The Bidder shall submit its offer in response to RFQ in a sealed envelope clearly marked on the top of envelop as “Quotation for”. The quotations shall be stamped for receipt indicating both

the date and time of receipt. The quotations received by the public body shall be submitted directly without opening to the relevant authority on the appointed date for opening, examination and evaluation of offers received in response to RFQ.

The Request for Quotations Method shall be undertaken in the manner described in the Proclamation and Directive and the reasons for selection of procurement by the Request for Quotations Method shall be documented in the records of procurement.

Directive Article 24.1:

Public bodies may apply request for quotation to procure goods, works or services the need of which can't be foreseen, or which can't be included in the Public Body's bulk purchase of needed items, or which are needed for immediate use and the estimated value of which is within the threshold established in article 24.2 of the Directive.

CHAPTER THREE

MATERIALS AND METHODS

3.1 Description of the study area

The study area for the research where in Addis Ababa and the study participants were from domestic construction consulting firm and governmental offices, Nongovernmental and International companies which run and manage projects in Ethiopia.

3.2 Study Approach

This research paper is basically of a mixed research type where both qualitative and quantitative methods were employed. The approach followed for this paper can be summarized in the following points

- Conduct interviews and design a questionnaire,
- Population and Research sample,
- Sample size determination, questionnaire distribution and collecting data
- Data analysis

3.3 Research questionnaire design

Five pages of structured questionnaire were developed as a research tool for this study and it was built mainly using closed and unstructured (open) type of questions. Moreover, the questionnaire was developed in English version (Annex 1). The questionnaire consists of two sections

Section one: general information.

Section two: respondent's rank of the main influence of the selected procurement method on construction project performance and general questions to obtain perspective and opinion of respondents.

The structured questionnaire is probably the most widely used data collection technique for conducting surveys and it has been widely used for descriptive and analytical surveys

in order to find out facts, opinions and views. It enhances confidentially, supports internal and external validity, facilitates analysis, and saves resources.

3.4 Interview

The primary data were obtained from the local participants through the application of the interviews. Before carrying out the interview, the draft questionnaire form was sent to target interviewees who are selected randomly, specific time and dates were determined for interview. This provided a chance for the interviewees to study the questions and review his memory on how the selected procurement method affects performance in construction project before conduct an interview. The researcher interviewed client's representatives from Engineering department and consulting offices.

In the beginning of the interview, the researcher introduced himself to the respondent to create a friendly atmosphere, then thanked the respondent and affirmed that all the data to be collected would be used only for the research and would not be transferred to any other party. The duration of each interview is about fifteen minutes. The interviewee classified as shown in Table 3.1 below.

Table 3.1: participant attended interview

No	Target	No. of Participant
1	Engineering Procurement specialist	4
2	Consulting Offices	4

During the interviews, participants will be given freedom to discuss issues, listen to their peers, provide reflective comment and arrive at a shared understanding of collective experiences regarding procurement method use and what influence create on project performance.

These interviews gave to a far extent, accurate and clear information from interviewee due to the clarifications which made by the researcher and the interview objective was to obtain, from the interviewee, a consensus conclusion on how the selected procurement methods affect the performance of construction project in Ethiopia.

3.5 Population and Research sample

The target groups in this study are client's of construction projects and their representatives. Accordingly, there are two types of population were considered in this study. The first population is the Engineering procurement department as client's representatives, who were worked within the organizations.

The second population is construction project consulting offices, which were established to prepare contract documents, manage and supervise construction projects and these offices registered by the under Ministry of Construction by City Government of Addis Ababa Construction Bureau in Ethiopia. According to City Government of Addis Ababa Construction Bureau till March 2017, the total number of these consulting companies is 288 and they are classified as follows: first class 60 companies, second class 8 companies, third class 72 companies , class four 11 companies, class five 9 companies and class six 4 companies . The researcher targeting only the first class of construction consultant offices because they have a good experience in construction and procurement method management for a whole large construction projects in Ethiopia.

3.6 Sample size, questionnaire distribution and collecting data

For the first population, the number is determined by the researcher as not large as there are 39 Engineering procurement specialists worked in different organizations who owned a large construction projects in Ethiopia. So it is not required to determine sample size and it can be selected all of 25 procurement specialists/ Engineering department as client's representative and the whole population was taken as the concerned sample size.

To choose the sample size from the second population which is the first class of consulting company in Ethiopia (60 offices), the formula of Kish equation (1965) can be used. The sample size can be calculated as shown below for 94% confidence level (Assaf et al., 2001; Israel, 2003; Moore et al., 2003)

- n= n'/ [1+ (n'/N)] (Kish equation)

Where:

- N = total number of population
- n= sample size from finite population
- n' = sample size from infinite population = S^2/V^2; where S^2 is the variance of the population elements and V is a standard error of sampling population.

(Usually S = 0.5 and V = 0.06) So, for 60 first class consulting offices:

- n= n'/ [1+ (n'/N)]
- n'= $S^2/V^2 = (0.5)^2/(0.06)^2 = 69.44$
- N = 60
- n= 69.44/ [1+(69.44 / 60)] = 32

This means that the questionnaire should be distributed to 32 to first class of construction consulting offices in order to achieve 94% confidence level.

According to previous results of sample sizes, questionnaires were distributed as follows: 25 to Engineering department and 32 consulting offices. 50 questionnaires were received (88%) as follows: 21 (84%) from procurement specialists 29 (91%) from consulting offices as respondents. These percentages are shown in Table 3.3.

Table 3.2: Percentages of received questionnaires

Type	Concerned Sample size	No of respondent	Percentage %
Engineering Procurement specialist	25	21	84
Consulting offices	32	29	91
Total	**57**	**50**	**88**

These respondents are procurement manager, procurement assistant, projects manager, construction managers, director or vice director, consultant and others, as they have a practical experience in procurement and construction industries fields. Their sufficient experiences are a suitable indication to find out the perceptive of the relative importance of each factor affecting the selection of procurement method. Their experiences included many construction fields such as buildings, roads, and water and sewage projects. Table 3.4 shows summary for frequency of job title of the respondents.

Table 3.3: Frequency of job title of the respondent

Position	**Frequency**	**Percent (%)**
Director/Vice director	4	8
Procurement manager	8	16
Procurement assistant	5	10
Consultant/ Office Engineer	17	34
Project Manager/Engineer	13	26
Other	3	6
Total	**50**	**100.00**

3.7 Data analysis

In order to be able to select the appropriate method of analysis, the level of measurement must be understood. For each type of measurement, there is/are an appropriate method/s that can be applied and not others. In this research, ordinal scales were used. Ordinal scale as shown in Table 3.5 is a ranking or a rating data that normally uses integers in ascending or descending order. The numbers assigned to the important (1, 2, 3, 4, 5) do not indicate that the interval between scales are equal, nor do they indicate absolute quantities. They are merely numerical labels. Likert scale is shown in Table 3.5 (Cheung et al, 2004; Iyer and Jha, 2005; Ugwu and Haupt, 2007)

Table 3.4: Ordinal scale used for data measurement

Item	Very low	Low	Medium	High	Very High
Scale	1	2	3	4	5

After collecting the data from questionnaire which distributed to client representatives and consulting offices, the data was analyzed and the result documented, the analysis concentrate on two directions which the first one is to identify and rank of the effect of the selected procurement method in construction projects, and the second one is to assistance in future studies to develop strategies to build a model to select the best

procurement method in construction projects in Ethiopia. Furthermore, the data was analyzed using descriptive statistics such as frequency and percentage and SPSS 20.

The researcher utilized the following statistical tools:

1) Frequency and descriptive analysis

2) Relative Importance Index (RII)

The relative importance index methods (RII) are used to determine the ranks of effect.

The relative importance index is computed as (Sambasivan and Soon, 2007)

$$RII = \frac{\sum W}{A \times N}$$

Where:

W = the weighting given to each factor by the respondents and ranges from 1 to 5

A = the highest weight (i.e. 5 in this case)

N = the total number of respondents

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter discusses the results that have been deduced from a field survey of 57 questionnaires, 29 respondents from consulting offices, and 21 engineering procurement specialist respondents. Part one will present the profiles and all necessary information about the respondents, part two was designed to identify and rank the effect of the selected procurement method on performance of construction projects in Ethiopia, the type of procurement method in practices in Ethiopian construction industry. The results obtained are compared with the relevant literatures and the researcher comments are added.

4.2 Part one: Organizational profiles

This section mainly designed to provide general information about the respondents in terms of sex, position, and years of experience, qualifications, type of institutions, and the type of projects deal with.

Sex of respondent

Table 4.1 shows the frequency and percent of Sex of the respondent that are 54 % were male and female, 26%.

Table 4.1: Frequency and percent of Sex of the respondents

No	Sex of Respondent	Frequency	Percent %
1	Male	27	54
2	Female	13	26

Position of respondent

Table 4.2 shows the frequency and percent of job title of the respondent that are 8 % were director or vice director, 16% of respondents were procurement managers, 10% of

respondents were procurement specialist, 34% of respondents were office Engineer, and 26 % of respondents were projects manager.

Table 4.2: Frequency and percent of position of the respondents

Position	Frequency	Percent %
Director/Vice director	4	8
Procurement manager	8	16
Procurement assistant	5	10
Consultant/ Office Engineer	17	34
Project Manager/Engineer	13	26
Other	3	6
Total	**50**	**100.00**

Experience years of the respondents

Experience as a general concept comprises knowledge of or skill in or observation of something or some event gained through involvement in or exposure to that thing or event.

Table 4.3 shows that, 16% of the respondents have years of experience between 1 - less than 5 years, 24 % of the respondents have years of experience between 5 - less than 10 years, and it can be seen that respondents with an experience more than 10 years have the highest percentage (28 %), which is cross checked with the obtained results in the position of the respondent (more than 34% of the respondents have a good procurement experience). This gives a good indicator that the respondents have a good experience in procurement field. Moreover, the variety of experiences between each group will enrich the research with different knowledge and information.

Table 4.3: Experience years of respondents

Years of experience in the line of work	Frequency	Percent %
From 1 to less than 5 years	8	16
From 5 to less than 10 years	12	24
From 10 to less than 15 years	14	28
From 15 to 20 years	10	20
More than 20 years	6	12
Total	**50**	**100**

Qualification of the respondents

As depicted in Table 4.4 below, it is clear that 42% of the respondents have a master degree while the most of the respondents have a bachelor's degree. This result also supports the quality of gained information from respondents who are almost qualified and experienced.

Table 4.4: Qualification of respondents

Qualification	Frequency	Percent %
PhD	0	0
Master	21	42
B.Sc.	27	54
Diploma	2	4
Other	0	0
Total	**50**	**100**

Type of institution

Table 4.5 shows that, 52 % of the respondents are governmental, 2% of the respondents are international institution, 4 % are NGO‟s, and the best representative type are consulting offices which represent 42% from the total sample. It is important to point that most of the constructed projects were designed, processed, and supervised by consulting

offices and/or Client's Engineer Department. The high percentage of this category reflects a good indicator to ensure from quality information beside the other general information.

Table 4.5: Type of institutions

Institution type	**Frequency**	**Percent %**
Governmental	26	52
International	1	2
Non-governmental (NGO)	2	4
Private Sector	21	42
Other	0	0
Total	**50**	**100**

Type of projects the organizations are dealing with

Table 4.6 shows that (94%) of the surveyed organizations are dealing with both building construction and infrastructure projects (Roads, Buildings, water, and sewage) as those three fields are the prevailing construction fields.

Furthermore, Table 4.6 demonstrates that (30%) from respondents are involved, in a way or another, in building works, (26%) are involved in roads works, (38%) are involved in water and sewerage works, and only (6%) are involved other works.

Table 4.6: Type of projects the organizations are dealing with

Type of projects respondent organization dealing with	**Frequency**	**Percent %**
Buildings	15	30
Roads	13	26
Water & Sewage	19	38
Electro mechanics	0	0
Other	3	6
Total	50	100

Value of projects executed in the last five years

From Table 4.7, it is noticed that only (2 %) of the organizations have executed a volume of work with a value less than or equal 20 million birr which means that most of executed projects are mainly large size construction projects. In addition, the Table shows that (6%) of organizations executed projects with a value of less than 50 million birr, during the last five years. (14%) of organizations executed projects with a value between 50 and less than 100 million birr, and (78%) of organizations executed projects with a value more than 100 million birr.

Table 4.7: Value of implemented projects during the last five years

Value of implemented projects during the last five years	**Frequency**	**Percent %**
10 – less than 20M	1	2
20 – less than 50M	3	6
50 – less than 100 M	7	14
More than or equal 100M	39	78
Total	**50**	**100**

4.3 Part Two: perspective about procurement methods used in Ethiopia

What procurement methods are you familiar with?

Table 4.8: The percentages of procurement method familiarity

Procurement Methods	**Frequency**	**Percent %**
Traditional Procurement Method (Separated)	33	66
Design and Construct Procurement Method (Integrated)	14	28
Management Procurement Method (Packaged)	3	6
Public Private Partnership Procurement Method (PPPP)	0	0
Other	0	0
Total	**50**	**100**

Table 4.8 shows that 66 % of the respondents are familiar with traditional procurement method as this method is widely experienced, known, and spread in different organizations while only 34% of the respondents are familiar with the other procurement methods as shown in Table 4.8

What is the most common procurement method selected by your organization?

Table 4.9: The percentages of common procurement methods selected by organizations

Common procurement methods selected by	**Frequency**	**Percent %**
Open Bidding / least qualified bidder	29	58
Request for Proposals	7	14
Two-Stage Bidding	2	4
Restricted Bidding	1	2
Request for Quotations	10	20
Direct Procurement/ Single -Source procurement	1	2
Other	0	0
Total	**50**	**100**

Table 4.9 shows that, the most common procurement method that selected by the respondent in construction projects in Ethiopia is a traditional procurement method (open tendering) which represent around two third (58%) from the total sample and the high percentage of this result reflects to ensure that there is no a variety of procurement methods selected and used in construction projects. The second most common procurement method is a request for quotation method which represents 20 % from the total sample. It is important to point that other common procurement methods are very rarely selected in construction projects.

What is the most common type of construction contract type selected by your organization?

Table 4.10: The percentages of common type of construction contract selected by organizations

Most common type of construction contract type	Frequency	Percent %
Lump sum contract	18	36
Measurement Contract (Based on Bill of Quantities)	32	64
Cost Reimbursement as cost plus	0	0
Lump sum and Schedule contract	0	0
Other type	0	0
Total	**50**	**100**

Table 4.10 shows that, the most common type of construction contract method that selected by the respondents in construction projects is a measurement method based on bill of quantities which represent 64% from the total sample and the high percentage of this result reflects to ensure that there is no a variety types of traditional procurement method selected in construction projects.

The second most common type of traditional procurement method is a lump sum method which represents 36.00% from the total sample. It is important to point that the other two methods are not known in construction projects in Ethiopia.

The result of this study is in the agreement with Rosli et al., (2006) result. Davis et. al., (2008) stated that with traditional lump sum contracts the intention is that there should usually be a fair and balance of risk between parties. The balance can be adjusted as required, but the greater the risk to be assumed by the contractor. So, this method is widely selected in construction projects but is used less than a measurement method.

Do you believe project performance influenced by the type of procurement method selected?

Table 4.11: The percentages of project performance influenced by the type of procurement method

Do you believe project performance influenced by the type of procurement method selected?	Frequency	Percent %
Yes	47	94
No	3	6
Total	**50**	**100**

Table 4.11 shows that, 94 % of the respondent believe that the selected procurement method have potential effect on the performance of the construction project which confirm the significance of the research and the researchers perspective toward the study the problem

Influence of the selected procurement method on project performance

This part consists of results and discussion of the effect of the selected procurement method on the performance of the project. These influences were grouped into five groups. The first group is influences on project completion time. The second group influences on project final cost. The third group is influences on project targeted quality. The fourth group is influences on external factor. The last is influences to project related risk.

The results of this part of study provide an indication of the relative importance index and rank of the influences of the selected procurement method on the performance of the project. Table 4.12 shows summary of major groups ranking according to each type of target group and Table 4.13 shows summary of ranking according to all respondents.

Table 4.12: RII and rank for the influences for each type of target group

No	Influenced group	Engineering procurement specialist		Consulting office	
		RII (%)	**Rank**	**RII (%)**	**Rank**
1	Project Completion time	91.43	1	84.14	2
2	Project final cost	87.62	2	90.34	1
3	Project targeted quality	80.95	3	80.69	3
4	External Environment	56.19	5	47.59	5
5	Project related risk	68.57	4	71.03	4
	All influence	**76.57**		**74.35**	

Table 4.13: RII and rank for the influences for all responses

No	Influenced group	RII Mean (%)	Rank
1	Project final cost	88.98	1
2	Project completion time	87.79	2
3	Project targeted quality	80.82	3
4	Project related risk	69.8	4
5	External environment	51.89	5
	All influence	**75.86**	

From Tables 4.12 & 4.13 mentioned above, it is noticed that effect on project final cost has been ranked by all respondents in the first position with RII equal 88.98%. At the same time effect on project final cost, has been also ranked by the consulting office respondents in the first position with RII equal 90.34%. This group is the most important one for all respondents and it is obtained that this factor group has a similar importance for each target group because procurement specialists and consultants are usually interested with effect on project final cost. This is mainly due to financing issues and client interference which are considered very important by consultants and this is related to client satisfaction. In addition, all respondents remarked that factors related to project final cost are an important indicator affecting strongly the selection of an appropriate procurement method.

Shiyamini and Rameezdeen (2007) are in agreement with this result as effect on project cost ranked in the first position and it affects strongly the selection of procurement

method. The researcher illustrated that this group can be one of the most important group at macro level in the procurement selection process. This is more important for consulting office than for others because liquidity of organization, design cost, and consultant fees affect the project cost and this is related to client satisfaction.

Mahon (2011) are in line with this result as factors related to cost group affects strongly the selection of procurement method and the researcher confirmed that the procurement selection parameter of budget/cost requirements was universally rated as the single most influential parameter and was considered as most important criteria for judgment on procurement route selection. This was closely followed by time factors. These two parameters were clearly rated as being the most influential in terms of procurement selection

Influences on project completion time have been ranked by the all respondents in the second position with RII equal 87.79%. It has been ranked by the procurement specialist respondents in the first position with RII equal 91.43% and has been ranked by the consulting offices respondents in the second position with RII equal 84.14%.

An influence on project targeted quality has been ranked by the all respondents in the third position with RII equal 80.82%. It has been ranked by the procurement specialist respondents in the third position with RII equal 80.95%. Also by consulting offices respondents in the third position with RII equal 80.69%. It is not surprising to observe that this effect is the most important one for both. An influence on project related risk has been ranked by the all respondents in the fourth position with RII equal 69.8%. It has been ranked by the procurement specialist and consulting offices respondents in the third position with RII equal 68.57% and 71.03 respectively.

Influences on external environment is has been ranked by the all respondents in the fifth and last position with RII equal 51.89%. Also, it has been ranked by the procurement specialist respondents and the consulting offices respondents in the fifth and last position with RII equal 56.89% and 47.59% respectively.

Are you satisfied about procurement system of your organization?

Table 4.14: The satisfaction percentages of procurement system

The satisfaction percentages of procurement system	Frequency	Percent %
yes	12	24
No	38	76
Total	**50**	**100**

From Table 4.14 above, it is noticed that only around one third of the respondents dissatisfied with procurement system in their organizations while around two third of them are satisfied. This is mainly because of the good governance of procurement principles such as transparency and accountability in their organizations

What types of procurement method would you like to see more use in the construction project in Ethiopia?

Table 4.15: The percentages of procurement method types would like be used more use in the construction project in Ethiopia

Procurement Method	Frequency	Percent %
Traditional procurement method	11	22
Design and Build method	32	64
Management procurement method	3	6
PPPP as build operate transfer method	4	8
Total	**50**	**100**

As depicted in Table 4.15above, it is clear that more than a half (64%) of the respondents would like to see a design and build procurement method is used more in the use in the construction project in Ethiopia while only 22.0% of the respondents would like to see a traditional procurement method used more in the construction project in Ethiopia. This result support that the respondents would like to deal with a nontraditional procurement methods and applied a new procurement methods rather than a traditional method in the future in construction projects of Ethiopia.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

Based on the results obtained from this research, the following research conclusions are drawn:

- A total of 5 factors, out of these there most influential criteria for the measurement of project performance influenced by the selected procurement method were synthesized in the main survey, which were shown to be reliable. Data were collected from a representative sample of professional procurement staff and consultants offices in Ethiopian.
    1. Project completion time
    2. Project final cost
    3. Project targeted quality
    4. Project related risk
    5. External environmental factor

Clients can truly benefit from realizing the importance of above several factors into the selection of procurement method.

The three most influential effects, as evaluated by procurement specialists and consultants, are: Project final cost, Project completion time and project intended quality.

- It was concluded that, both procurement specialists and consultants generally agree on the ranking order of the influence affecting the selected procurement method. This agreement confirms the influential effect of those factors on the selection of procurement system which provides a level of validation for this research. According to the results of this study, it was concluded that, there is no difference of the opinions between procurement specialists and consultants in the selection method affecting the performance of a project.
- The results give a general indication that both the conventional (traditional) and non conventional procurement methods are currently embraced in Ethiopia. This study reveals approximately two-thirds (58%) of construction projects are executed using

variants of traditional procurement method; 28% are through variants of design and build method; 6.0% are executed through management procurement method.

- The procurement methods in use are still much of variants of traditional methods. Ethiopian construction remains in the phase of almost exclusively using traditional methods specifically the lowest qualified bidder. This may be presumably due to the proclamation and directive set by the public procurement Agency and this familiarity was found regarding to a long age existence of the PPA systems in the Ethiopia construction industry. It could be noted that the percentages of the use of management procurement and PPPP methods are still significantly very low, indicating that the clients and their representatives are still not well familiar with this variant of non-conventional procurement system, or are yet to appreciate their advantages. The results of the study indicate that only 6% are familiar with management procurement method while 0% is familiar with PPP procurement method.
- The majority of respondents have indicated that current procurement methods (most prominently traditional) have directly contributed to projects overrunning in terms of cost and time, suggesting that this method is unsuitable for a modern, progressive construction industry in Ethiopia. It is clear that more than a half (58%) of the respondents would like to see a design and build procurement method used more. Only 28% of the respondents would like to see a traditional procurement method used more.

This result support that the respondents would like to deal with a nontraditional procurement methods and apply a new procurement methods rather than a traditional one in the future for construction projects in Ethiopia.

- Among the variant types of traditional procurement method, measurement method based on bill of quantities (Measure and pay method) had the highest selection share.

5.2 Recommendations

The following recommendations are the most important ones that can be deduced by this research

- All clients and consultants of the construction industry in Ethiopia, whether from the public or the private sector, should familiarize themselves with various procurement methods as this will assist them in making well-informed procurement method.
- Clients and consultants should monitor the quality and performance of procurement methods which used in their organizations in terms of hire a qualified procurement staff in order to obtain the true decision related to the selection of procurement method even within the restriction set by PPA.
- It is also recommended that training courses, seminars, and workshops in procurement should be conducted. These activities would improve and increase the capabilities of procurement staff in using mathematical models for the selection of an appropriate procurement system.
- The client's actual needs, requirements, objectives and project goals must be interested and accurately conveyed to the project team in order to enable the project team to develop a sound procurement strategy and system beyond the limitation set by the PPA.
- The Agency should be open to see and study the different alternative procurement methods applicable in the world.
- A clear type of procurement system should be established at a very early (planning) stage of the project which will determine broadly what has to be done, how it must be done, by whom it must be done, where it must be done and when it must be done.
- Construction planners, managers and all other procurement specialists involved in procurement decision-making should formulate a systematic selection approach, as this will assist in eliminating unnecessary cost and time over run.
- It is also recommended to establishment of legislation and laws that encourage the using of alternatives procurement methods such as Design and Build and BOT methods.

- A follow-up advance study on the non-traditional procurement methods such as design and built procurement methods.
- Future research should focus on developing models for the selection of an appropriate procurement method. These models could include detail project-specific factors such as the project type, the degree of project complexity, and time constrains of project, and others.
- A follow-up study that further researches the effect of the type of procurement methods on the project performance would be beneficial. The future researches could be examined in-depth the performance of several construction projects together with the procurement methods selected and implemented.

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APPENDICES

Addis Ababa Science and Technology University School of Architecture & Civil Engineering

(Questionnaire)

In fulfillment of Master of Engineering study requirement

Effect of Procurement Methods on Construction Project Performance in Ethiopia

The aim of the research is **to assess the effect of procurement methods on construction project performance in Ethiopia**, to review the different procurement methods applicable in Ethiopia and to identify the major causes of poor procurement methods and systems in the construction industry.

This Questionnaire is required to be filed with relevant facts as much as possible. All data included in this questionnaire will be used only for academic research and will be strictly confidential. After all questionnaires are collected and analyzed, interested participants of the study will be given feedback on the overall research result**.**

More importantly, if you find any of the questions unclear or ambiguous please page (make a missed call) for the researcher on the following cell phone number or email address to get further elaboration.

Cell phone **0911 44 33 83 or 0961 14 08 08/ email: - yosisa2012@gmail.com**

I thank you in advance, for your invaluable cooperation.

Part One: General information: Please add (√) as appropriate:

1. Name / Optional/_____

2. Sex

- ☐ Male
- ☐ Female

3. Position

- ☐ Director/Vice director
- ☐ Procurement manager
- ☐ Procurement Specialist
- ☐ Consultant/ Office Engineer
- ☐ Projects Manager
- ☐ Other please specify_____

4. Years of experience in the line of work

- ☐ From 1 to less than 5 years
- ☐ From 5 to less than 10 years
- ☐ From 10 to less than 15 years
- ☐ From 15 to 20 years
- ☐ More than 20 years

5. Qualification

- ☐ PhD
- ☐ Master
- ☐ B.Sc.
- ☐ Diploma
- ☐ Other please Specify_____

6. Institution type

- ☐ Governmental
- ☐ International
- ☐ Non-governmental (NGO)
- ☐ Consultancy office
- ☐ Contractor
- ☐ Private Sector
- ☐ Other please Specify _____

7. Type of projects your organization dealing with

- Buildings
- Roads
- Water & Sewage
- Electro mechanics
- Other please Specify_____

8. Value of executed projects executed in the last five years (in million Birrs)

- 10 – less than 20M
- 20 – less than 50M
- 50 – less than 100M
- More than or equal 100M

Part Two: General Questions

1. What procurement methods are you familiar with?

- Traditional Procurement Method (Separated)
- Design and Construct Procurement Method (Integrated)
- Management Procurement Method (Packaged)
- Public Private Partnership Procurement Method (PPPP)
- If any other please specify_____

_____

_____

2. What is the most common procurement method selected by your organization?

- Open Bidding / least qualified bidder
- Request for Proposals
- Two-Stage Bidding
- Restricted Bidding
- Request for Quotations; and
- Direct Procurement/ Single -Source procurement

- If any other please

  Specify_____

_____

3. What is the most common type of construction contract type selected by your organization?

- Lump Sum contract
- Measurement Method (Based on Bill of Quantities)
- Lump sum and schedule contract
- Cost Reimbursement as Cost Plus
- If any other please Specify

_____

_____

4. Do you believe project performance influenced by the type of construction procurement method selected?

- Yes
- No

5. How the selected procurement method influences the performance of the project in your organization Please identify (carefully) the degree of influence of the selected procurement method on project performance in your organization on the following project performance criteria

Very High = 5 High = 4 Medium = 3 Low = 2 Very low = 1

No	Main Influence	Degree of Influence				
		Very high=5	High=4	Medium=3	Low=2	Very low =1
1	Influence on project completion Time					
2	Influence on project final Cost					
3	Influence on project targeted Quality					
4	Influence to external environment					
5	Influence to project related risk					

6. Are you satisfied about procurement method of your organization?

- Yes
- No

7. What forms of procurement method would you like to see more use of in construction project in Ethiopia?

- Traditional Procurement Method (Separated)
- Design and Construct Procurement Method (Integrated)
- Management Procurement Method (Packaged)
- Public Private Partnership Procurement Method (PPPP Method)
- If any other please Specify

_____

_____

_____

8. Finally, What would you suggest to be done so as to improve the procurement methods in construction projects in Ethiopia?

_____

_____

_____

_____

_____

_____

_____

Thanks for your cooperation…

Researcher

Sintayehu Gebissa

DECLARATION AND COPY RIGHT

Sintayehu Gebissa Bulti, declare that this thesis is my own original work that has not been presented and will not be presented by me to any other University for similar or any other degree award.

_____

Signature